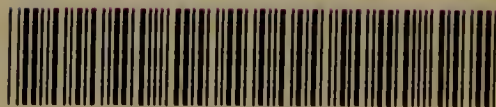


STUDIES IN PHOTOGRAPHY

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J. Andrews, B.A.



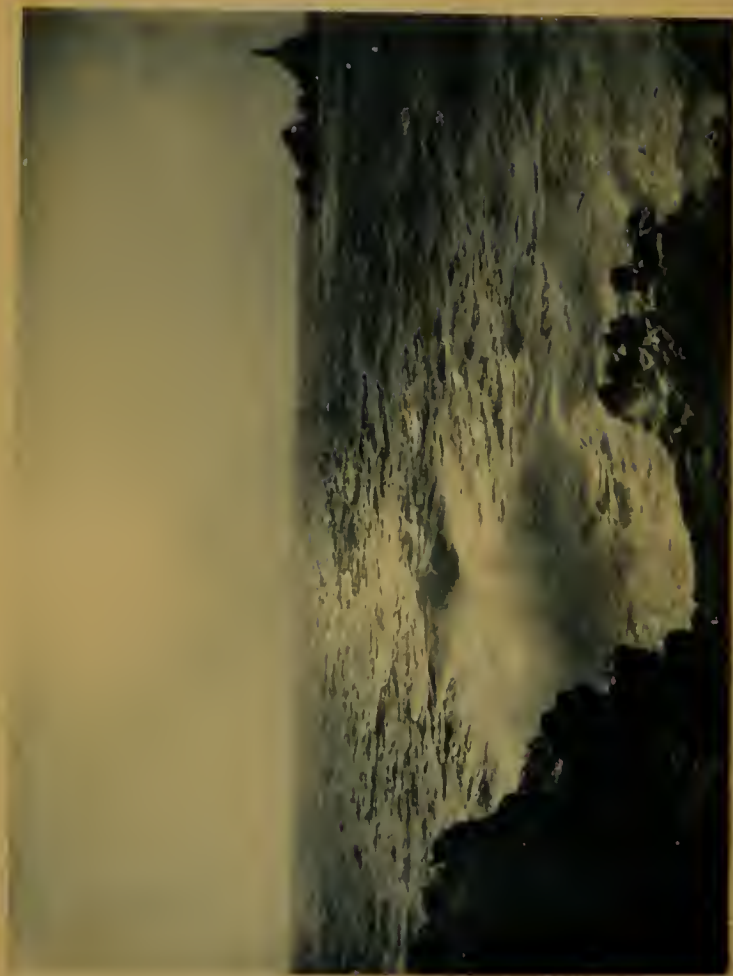
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A. Pickers Turner.

STUDIES IN PHOTOGRAPHY.

*"To him, who in the love of Nature holds communion with
her visible forms, she speaks a various language."*

W. C. BRYANT.





STUDIES

IN

PHOTOGRAPHY.

BY

JOHN ANDREWS, B.A.

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TO

ALL LOVERS OF ART AND NATURE

THESE PAGES

ARE RESPECTFULLY DEDICATED.

(2)

ZHE /AND

INTRODUCTION.

IN the first few chapters of this book I have endeavoured to consider the claims of Photography to rank as an original Art. Now, a great deal has been written on this subject which has given rise to much angry discussion, artists and critics, as a rule, until lately maintaining that in no sense can Photography ever be an art at all ; while the advance-guard of photographers claim to produce work in *monotone* as artistic, if not more so, than that of many painters. As usual, the truth probably lies between the extremes. The brush in the hands of a competent artist will produce results such as no photograph can approach, because they are the direct reflection of the individual genius

of the painter ; as Emerson finely says, " Art is Nature passed through the alembic of man." On the other hand the camera will produce transcripts of Nature with a fidelity and beauty to which no human work can attain. They are, in fact, sister arts ; one is the original genius of the family, and the other the patient drudge.

But the advance-guard of photographers seem to imagine that by new devices in pinholes, focussing, and printing, they will be able to rival art in its own sphere ; we think this is a mistake. Much has been done, and immense strides will no doubt be made in the future, but the very nature of things will prevent photography from ever taking her sister's place, or becoming more than an art of reproduction.

Photography, essentially, is a machine-made art, though it makes all the difference in the world who guides the machine. A photographer who is also an artist will produce incomparably finer work than one who is not ; but do what he may, he will never produce

work that will compare with the original creations of the real artist in his own line, for Art is poetry, and sees Nature through that ideal light that "never was on sea and shore," while photography has more or less to content herself with the "light of common day." And she may well be content therewith, for while it is given to few—very few—of a generation to produce original art work that will live, the beauties of Nature reproducible by the camera are within the reach of all. Each art is more or less distinct from the other, and beyond a certain point they will not combine; but that each can be, and is, of the greatest use to the other is becoming every day more apparent. Art teaches us the rules of composition, perspective, and light and shade, and shows the photographer how they may be applied; and photography reproduces every detail and appearance of Nature the artist demands, with a truth to which he cannot aspire.

In the following pages (which are for the

most part reprinted from the *Photographic Quarterly*, and other reviews) the author has endeavoured to elucidate the principles above referred to, and to add thereto some practical remarks which he trusts will be found useful to the photographer who aspires to produce more artistic work, and to the artist who, wise in his generation, does not disdain the very material assistance which photography can give.

ST. AUBINS,

JERSEY, 1892.

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STUDIES IN PHOTOGRAPHY.

CHAPTER I.

ARTISTIC PHOTOGRAPHY.

"Let Nature be your Teacher."

WORDSWORTH.

NOT so very long ago the above heading would have been treated with derision in artistic circles. But this is rapidly being changed. Artists must look to it ; say what they will about selection, idealism, and expression, the photography of the new or impressionist school, and in the near future too, will run them close in monotint pictures at all events ; and suppose we achieve colour, what then ?

It is a singular thing that for the last forty or fifty years photography, artistically speaking,

has been almost stationary, and while immense advances have been made in chemicals, lenses, printing processes, and all material appliances, art and artistic feeling have been conspicuously absent. The ordinary photographs of thirty years ago were as good (some think better) than the ordinary photographs of to-day. Look at any collection and see.

With the exception of Mrs. Cameron's studies, which were the product of great artistic feeling and an original method, there is little of art to be seen in the past history of photography. There are three chief causes for this : excessive or obtrusive detail, want of atmosphere, and the absence of artistic education and feeling. The childhood of photography (and it has been a long one) is, however, passing away ; on every side artists and educated people are working with hand and other cameras, and are astonished to find latent capabilities which they never dreamt of in the much-despised photography.

Let us consider shortly, the above-mentioned

defects of photography as an art process, and point out some of the methods now being tried for their removal.

I. *Obtrusive Detail*.—This is what so delighted us in the early times: it was all there, every stick and stone, down to the high light in a fly's eye. Independently of art or picture making, the result often is marvellously beautiful: look at the texture of rocks and fabrics of all kinds, the exquisite drawing of all natural objects, such as delicate grasses, ripple marks on sand, almost the bloom if not the colour of flowers can be caught; think of the delicate representation of the higher clouds, and the fall and wash of ocean waves. No human work can approach this. Well might Mr. Ruskin say, speaking of monotint, "The perfection of work would be tinted shadow, like photography without any obscurity or exaggerated darkness."

And all this beauty is produced by the very perfection of the lens; in fact, photography suffers from "the defects of its virtues." It is

too good ; it tells us too much. The Pre-Raphaelites made the same mistake, and in trying to reproduce all the details of a subject defeated their own aims. How then are we to get rid of this superfluous detail in photography? Several methods have been suggested : the simplest of them is the plan of not using the lens at its sharpest focus,—very beautiful effects may be obtained in landscapes by this method ; another plan is what is called pinhole photography, or the suppression of the lens altogether.* A third plan is reversing the negative in printing, or printing through ground glass or tissue paper,—very soft and beautiful effects may be produced by these methods, and the atmosphere of nature suggested. The result obtained is sometimes not unlike French monotone pictures, or the first blot or lay-in of a picture, which often suggests more of nature than the finished work.

* A very interesting paper on Pinhole Photography by W. A. Maskell will be found in the *Photographic Quarterly*, Vol. II., No. 5.

With all these methods, however, the difficulties of selection and composition remain, and these are only to be overcome partially by careful thought and study of the work of the great masters. Instead of taking so many pictures, how much better it would be to take a few carefully considered ones!—the subject should be thought over and visited at all lights, and a sketch of it is of great use in deciding what to take in and leave out. Another useful plan is to study the subject in a Claude glass; those who have never used one will be surprised and delighted at the beauties it reveals.

2. *Want of Atmosphere*.—This arises chiefly from the inability of photography to render the true scale of light and shade; as Mr. Hamerton says, it is “unable to make those subdivisions in the scale which are necessary to attain relative truth.”

Now, the effects of light and atmosphere are the most beautiful things in nature, and are the aim and despair of all artists worthy of the

name. They are the very poetry of landscape ; as Mr. Leslie well says, " Rocks, trees, mountains, plains, and waters are the features of landscape, *but its expression is from above*,—hence the paramount importance of the sky in landscape." And here much is to be learnt from observing the practice of good painters : Turner and Constable were always studying the sky—"going out skying," the latter calls it, and the photographer should do likewise.

Every landscape should have its appropriate sky,—it is the keynote of the picture. In Mr. Robinson's works on Artistic Photography will be found some admirable remarks about skies, and how to obtain them, and print them when obtained.

The great difficulty is so to moderate the actinic power of the sun as to get the sky and the landscape both fairly represented ; the sun is a treacherous ally,—while he is painting in our foreground he quietly rubs out the sky, and the result is vacuity. Here too we may learn of

artists, who always prefer the morning or evening effects ; then it is that the landscape assumes breadth and repose, and unnecessary details are hidden in the advancing shadows.

Not to speak of the magnificence of sunset and sunrise, how beautiful is the repose of twilight, when a deep calm settles down on sea and shore ! This is the best time for landscape photography, the hour just after the sun has set ; of course longer exposure is required, but the most beautiful and poetical effects may be obtained. A dull day too, if not too dark, is admirable, and much better than the glare of sunlight, as the most tender half-tones can be secured. But to get these effects a photographer must be an enthusiast as well as an artist ; he must learn to watch and wait, and to count his failures as gain if he gets even a little nearer to his ideal.

Corot, the great French painter, used to get up at three o'clock in the morning ; and see how beautiful his pictures are, how redolent of

the dawn. After all, it is a question of artistic feeling, and it is a great mistake to suppose that without this you can produce artistic work. This artistic feeling must, however, be improved and restrained by education, and the best education is the careful study of nature and the works of the great masters of landscape art, such as Turner, Constable, Cox, and De Wint amongst our English painters, or Corot, Daubigny, Millet, and Rousseau amongst the French. By the careful study of the work of these men and comparing it with nature, much may be learnt of composition and light and shade, and must surely have a vast influence in the formation of sound taste and the improvement of photography.

This brings us to our third point, viz., the great advance that has taken place in artistic taste during the last thirty or forty years. In the matter of photography alone (for to this our remarks are confined), we see that vast strides are being made ; many artists and people of

educated taste are now included in the ranks of amateur photographers, and the works exhibited at the annual and other exhibitions show marked advance. In a review of a recent exhibition of the Photographic Society the *Times* says: "It illustrates very forcibly the distinct improvement which has recently been effected in printing methods, and it shows a marked advance—consequent to some extent on that improvement—if not in the artistic capacities of photographers, at all events in their powers of producing the most artistic results with the appliances at their command." This is very encouraging: certainly the greatest advances have been made in the printing and reproduction of photographs; numerous methods have been invented, and in many cases most beautiful results obtained. The day of the old silver print is passing away, faster, if possible, than the prints themselves, and platinotype, sepiatype, autotype, and other processes are taking its place. The results are to be seen everywhere in the illus-

trated books and art magazines. In fact, it would be almost safe to predict that the days of wood and steel engraving for the purpose of book illustration are numbered. Certainly in future all scientific works will be exclusively illustrated by the aid of photography. The truth is that artistic photography is behind the times; the printer has gone ahead and is waiting for his artistic ally. That he is coming up rapidly is certain, and everything that can be done to assist his progress will be hailed with delight by all true artists, whether they call themselves painters or photographers.

CHAPTER II.

ART IN RELATION TO PHOTOGRAPHY.

"All the arts have a common bond of union and relationship to each other."—CICERO.

A GOOD many years ago, when the collodion process was perfected, and Photography became a popular amusement, it was prophesied that the art of Painting would go out, especially portrait painting. This prophecy has, however, not been verified; and it has been perceived that while to some extent Photography and Painting are sister arts, and run in parallel lines, yet they each have a sphere of their own, and can render to each other most valuable assistance.

Let us consider some of the methods by which each art materially assists the other.

FIRST. *The aid Photography lends to Art.*

It has been said by Mr. Hamerton that " Photography is a most useful and curious invention, and of the greatest value for the record of plain facts about persons and places, but is not a fine art at all, and can never be made one." This statement is somewhat exaggerated, though undoubtedly it rests on a basis of truth.

As *a record of plain fact* it is useful to an artist by enabling him to complete his picture by means of added detail ; but no amount of detail or *facsimile*, either in a landscape or portrait, will make a picture, because the representation of nature by painting is an ideal work created by the genius of man—it is a selection of idealised forms endowed with life by means of light, shade, and colour. Emerson has well expressed this when he defines Art as " Nature passed through the alembic of man." How far this record of natural facts can be of use to a painter depends very much on the individual genius of the artist. Some artists make great use of photographs, while others use them scarcely, or

not at all. The advance of Photography, however, rather increases than diminishes the labours of the painter, as nowadays trees, rocks, and skies, and all natural objects must be represented in a more naturalistic way than they were a hundred years ago. Mr. Leslie has remarked in his "Academy Lectures," that "Photography may tend to relax the industry of *inferior* painters, but it will stimulate the exertions of the *best*, for *much* may be learned from it if it is used as a means of becoming better acquainted with the beauties of nature, but *nothing* if resorted to only as a substitute for labour." Owing to the great rapidity now attained by the use of gelatine plates and shutters, etc., most valuable and useful effects of light and passing clouds, expression, animals and birds in motion, waves and boats, etc., can be obtained; and these are of the greatest value as records of things that pass away.

In the reproduction of works of art of all kinds Photography has done, and is doing,

immense service to art and artists. The processes are innumerable, and some have been brought to great perfection. The Autotype Company have published a magnificent series of reproductions of the drawings and pictures of the old masters, and in *The Portfolio* and other magazines of art will be found specimens of the heliogravure and other processes. These are printed from ordinary negatives on to steel and copper plates, or wood blocks specially prepared, and are finished by the work of the engraver.

Drawings and works in one tint can be most successfully reproduced, and some artists work specially for such reproductions, which are largely used for newspaper and book illustrations. Pictures in colour are not, however, so successfully reproduced by Photography, owing to the salts of silver not being equally sensitive to all the rays of the spectrum. This is one of the causes of the failure, or rather of the limitation, of Photography in representing natural objects; the result is that they are false in local

colour. Great advances, however, have been made in what is called isochromatic photography, that is, the reproduction of the equal tone of the different colours, by the use of certain vegetable extracts and organic dyes with the gelatine emulsion.*

The true contrasts of light and dark of nature are not to be reproduced by Art or by Photography; in Art they can only be suggested by great economy of light, as flake white, the brightest light, is dark grey. Photography does not economise, and the result is blackness in shade, and vacuity in light. Many artists have their pictures photographed before sending them in to exhibitions, and these copies form a most valuable and instructive record of an artist's

* Isochromatic plates are now much cheaper than they were, and are coming into general use. A very complete article on "The Relation between Absorption and Sensitised Plates," by Prof. Acworth, will be found in the *Photographic Quarterly*, Vol. II., No. 7. See also Captain Abney's article in the "Encyclopædia Britannica," last edition, "Photography," in which his own researches and those of Vogel, Eder, Schuman and others, are fully described.

career. We believe Mr. Du Maurier makes great use of Photography. All his drawings for *Punch* are done in pen and ink three or four times the size required, and reduced by Photography. He took to this course some years ago, as he felt his eyesight failing, and has found the result most satisfactory ; besides, he is able to preserve his valuable original sketches, which would otherwise be destroyed in the engraving.

We have heard a good deal lately about Photography in Natural Colours, and if photographs true in their local colours can be produced, the art will be revolutionised and become of much greater assistance to artists even than it is at present. Scientific men, however, differ as to the possibility of this ever being done ; but we have seen so many wonderful things accomplished by science in the last few years, that it would be very rash to predict anything to be impossible.*

Another branch of reproduction is that of old

* See *post*, Chapter IV.

manuscripts and inscriptions, thus rendering popular and permanent things that are of a perishable nature. Old coins, have been reproduced in a very artistic and beautiful manner, and the authorities at South Kensington and the British Museum have published a number of photographic reproductions of many of the beautiful works of sculpture, metal, glass, lace, and china, etc., contained in those collections. All these things must be of immense use to artists and students.

I am not aware that portrait painters use Photography much, but I have seen a very successful portrait painted almost entirely from several photographs. As a rule Photography tells us too much. A very clever lady, Mrs. Cameron, produced some most artistic photographic portraits of Tennyson, Watts, and others, and she defeated the obtrusiveness of photographic detail, by putting her subjects a little out of focus, which gave them a massive breadth, not unlike the effects produced by some of the

old masters. Mr. Hamerton says that this is the nearest approach to fine art that Photography has yet attained.

With regard to landscape painting, a photograph of the intended scene is not of much assistance to an artist who has time and patience to complete his studies of detail and effect out of doors. Sir J. Millais, I believe, paints his large landscapes entirely out of doors, with the assistance of a wooden house specially constructed. There is, however, much to be learnt by comparing a sketch or the most careful study with a photograph of the same subject, especially with regard to scale; the artist habitually exaggerates the height of buildings and mountains, while a photograph in this respect gives or should give the truth of nature.

Photographic *groups*, of course, are much more difficult than single figures; and, however interesting they may be as mementoes, their artistic value is not very great. For fancy figure subjects, I do not think Photography of

much use. The late Mr. Rejlander, who was an artist by profession, made a special study of fancy subjects in Photography, but the result was not very successful. The photograph is far too realistic for this purpose, and suggests the make-up of the theatre.

Even Mr. H. P. Robinson, who has written some very useful manuals on Pictorial Photography, says that historical subjects are impossible ; and he wittily adds, " Queen Anne is dead, therefore you cannot photograph Queen Anne."

SECONDLY. *The assistance Art renders to Photography.* The principles of Art, if rightly understood, are of the greatest importance and assistance to a photographer. We hear and read a great deal about chemicals, and lenses, stops, and exposures, shutters and devices of all kinds, but little of the art of composition and arrangement of light and shade and pictorial effect.

What we all want is more study and thought, and not so many photographs. So much has

been written about Art and its so-called principles by Mr. Ruskin and other critics, that there is little left to say of any use. I venture, however, to offer the following observations :—

With regard to *portraits*. Here we have the best models in the works of Titian, Raphael, Vandyck, and our own Sir Joshua Reynolds and Gainsborough. What they chiefly aimed at and attained was the character of their subject; the treatment and accessories were of secondary importance—in fact, they thought out their pictures. Speaking of the portrait painters of his day, Sir Joshua Reynolds remarked—and one would almost fancy he must have been thinking of the modern professional photographer—“ They have got a set of postures which they apply to all persons indiscriminately, the consequence of which is that all their pictures look like so many signpost paintings.”

We all know the story of the man who painted all his friends, and when they were hung up discovered that they were all profiles,

and all looked the same way. Monotony should be avoided, and the best effect of light and shade suitable to the subject secured.

Very effective portraits can be taken indoors, by or near a window, with the blind partly down so as not to have too much top light. The difficulty is the shadowed side away from the light ; but if a white screen of paper or a sheet is held parallel to the window behind the sitter, very soft reflections may be obtained.

A portrait should fill up most of the space in a picture, otherwise it will look insignificant. If you look at any fine old portraits or old coins you will notice how the head nearly fills the canvas or the coin. Backgrounds should be as simple as possible. Green baize or a blanket make a very good background, and a plain background is much preferable to the fancy rockery work and other abominations we see so much of. In any case the background should harmonise with the subject.

If you look at the backgrounds of the great

portrait painters, you will see that they are thought out with the greatest care.

If more than a head is attempted, an easy, unstudied, and natural attitude should, if possible, be secured ; but we all know how difficult this is. There is also the difficulty of preventing the hands and feet being out of focus, and making the portrait a monstrosity. Hands should always be shown if possible, as they are very characteristic, and beautiful if rightly done. In fact, it has been said you may always detect the work of a good painter by the way his hands and feet are painted.

As to landscapes.—Here, again, monotony should be avoided, and the compositions of the great masters studied. And here Art has a great advantage over Photography, as great painters like Turner and others place their trees, clouds, architecture, etc., about just as they please when composing a picture ; while Photography takes in everything before it. Still much may be done by a little care and thought.

There are numerous so-called rules of composition laid down by writers on Art, such as the law of repetition, the law of principality, the law of contrast, etc. ;* but instead of dwelling on these, I would rather refer to Mr. Prout's definition of composition, which he says "is the grouping and arrangement of pictorial materials to obtain the unity of an entire expression"; or Mr. Ruskin, who says: "Composition means literally and simply putting several things together so as to make *one* thing out of them. Thus a musician composes an air by putting notes together in certain relations; a poet composes a poem by putting thoughts and words in pleasant order; and a painter composes a picture by putting thoughts, forms, and colours in pleasant order." If we cannot always succeed in arranging our pictures to our satisfaction, we need not despair, for Sir Joshua Reynolds says that "composition is the greatest difficulty the artist has to encounter."

* See Chapter V.

Light and shade should be carefully studied, and the effects of morning and evening light. It is good practice to take the same subject under different lights. Rembrandt is the great master of light and shade.

The sky is so beautiful, and may be made of such great assistance to the composition of a picture, that it should never be neglected. By means of proper shutters and stops I think more might be made of the sky than photographers usually do.

Effects of light and waves in motion, etc., can be admirably reproduced ; though, owing to the unequal sensitiveness of the silver salts, these effects look like very beautiful moonlights, and are commonly sold as such.

Mr. Hamerton has summed up the objections to Photography, from a purely artistic point of view, as follows * :—

* In his "Naturalistic Photography" (p. 284) Dr. Emerson has combated these assertions of Mr. Hamerton in his usual

1. Falseness of local colour, throwing the lights and darks of natural colouring out of tone.

2. Falseness in light and shade, not being able to make those subdivisions in the scale which are necessary to attain relative truth.*

3. Falseness in perspective and proportion, owing to the imperfection of lenses.

4. Literalness and incapacity for selection and emphasis, which are antagonistic to the artistic spirit.

Art has similar limitations :—

1. Local colour. No two people see colour exactly alike ; therefore the exact colours of Nature are not represented. Also there is

energetic style, but he does not throw much fresh light on the matter. No doubt plates and lenses are much improved since Mr. Hamerton wrote in 1860, but the principles he then laid down are incontrovertible, and as true now as they were then.

* See an article by Mr. H. Dennis Taylor on "Nature's Light Scales as Rendered by Photography," in the *Photographic Quarterly*, Vol. III., No. 9.

the inability of any pigments to represent the strength and beauty of natural colour.

2. Representation of the scale of light and dark is but a compromise and suggestion at the best.

3. Imperfection in drawing and perspective, which is common to all human work.

4. Failure and weakness of the power of selection and emphasis, owing to the incapacity of the artist.

With all its limitations, however, Photography is a most beautiful and interesting art. Its pursuit leads us to the study of chemistry, the laws of light and optics, and offers a wide field for clever manipulation and the exercise of ingenuity in a thousand ways; and when we remember that in science the goal of to-day is the starting-place of to-morrow, who can say what Photography may not achieve in the future?

Let us, therefore, utterly discountenance the idea that there is any antagonism between

Painting and Photography. They are both members of the same family, and if both have their limitations it is because nothing is perfect, and all that we can do is but an aspiration after that ideal perfection to which we may never attain.

CHAPTER III.

NATURALISTIC PHOTOGRAPHY.

“But who can paint
Like Nature? Can imagination boast,
Amid its gay creation, hues like hers?”

THOMPSON.

AS far as we can understand it, “Naturalistic Photography” is an attempt by a number of earnest workers to reproduce the mystery and beauty of nature under poetical aspects, and in accordance with the rules observed by the masters of Art. This, some may think, is a large order ; perhaps so, but the success already attained is a sure earnest of what may be done in the future. A glance at the illustrated books and papers, or at the walls of photographic exhibitions, shows that art ideas and motives are stirring the photographic world ; and though no

reasonable person imagines that photography will ever equal or supersede brush work, still there is a field, and a wide one, it may profitably occupy.

There is a vast amount of rubbish written about art and idealism, and other "isms," but the wise man knows that there is no royal road to excellence, and distrusts the man or the school who advocates "the true and only method" of representing nature ; in fact, as all roads lead to Rome, so all good methods will produce good art ; but we must never forget that in art, as in everything else, nothing is perfect. There is light and there is also shade. If this were more often remembered we should have less dogmatism, and our progress would be far easier ; there would be less friction and fewer "dust-heaps."

But some will ask, How are the mystery and poetry of nature to be reproduced by the camera ? How can you regulate your *machine* ? Well you must ask the engineer ; and this brings us

to the most important point of all, and that is, that without artistic perception and education you will get no artistic work—*ex nihilo nihil fit*. As W. Hunt, the American painter, well says, "It takes a painter to make a picture, it takes a painter to appreciate a picture."

But granted—and what a concession!—the artistic vision, let us consider what can be done, and remember that we are only now at the beginning of things ; new inventions and processes are brought out every day, and the artistic worker will not be slow to press many of them into his service.

First, then, in the selection of a subject. Now here the artist's knowledge of composition, perspective, and light and shade is of immense assistance. He knows what will make a picture, and by repeated trials will select the best point of view, the best lighting, etc. Take, for example, such a simple subject as a ship or two in a harbour. Now, if you photograph this subject broadside-on and in ordinary daylight

you will get, what you deserve, a most ordinary result. But get the ships in perspective, lying along the quay wall with the evening light behind them, reflected with all their spars in the harbour, and they will form a beautiful pyramidal group, which, if your exposure is right, will yield an artistic picture. The same knowledge of perspective and composition may successfully be applied to all subjects, and yet Dr. Emerson tells us that composition is "futility itself!" See, too, what may be done by the clever and artistic introduction of figures and skies—if you know how. The artist, when composing a picture, treats his materials like pieces of a puzzle, and plays them about at pleasure, and if this latitude is not permitted to the photographer, still he has sufficient for almost all practical purposes. Again, as to *values*; see what variety may be produced by judicious exposure. Photograph, for instance, a road scene, with a lofty bank of trees on one side, and a fine sky beyond, varying the exposure from $\frac{1}{10}$ of a

second, say, to two or three seconds, and see the differences in the values in the sky and trees you will obtain ; it will be time well spent, and the plates will not have been wasted. By practice of this sort the *engineer*, as we called him above, will thoroughly learn the capabilities of his machine, and will make it produce the tones he requires, just as a musician masters his instrument or an artist his materials.

Passing by the question of alteration of values by development, about which there is considerable difference of opinion, we come to the subject of suppression and omission of unnecessary or objectionable details. Now, here much may be done by judicious choice of position, but much more by the careful observation of suitable atmospheric conditions. The advancing shades of evening will conceal much and give breadth to the picture ; this is the time when the mystery and poetry of nature are best seen and felt, and much of it may be secured by photography. Dull and misty weather is also advisable for

some subjects. Atmospheric effects can be splendidly rendered by the camera, and every artist acknowledges their immense value in concealing objectionable details.

All these things should be carefully considered, and novel effects and combinations experimented upon. Surely, here is a wide field for the exercise, not only of technical skill, but of artistic talent.

The old school may say it is not legitimate photography. Well, let them. We remember when the use of body colour in water colour was considered illegitimate, but we have outgrown that. If the result be beautiful and artistic, few will care to question the means employed. An artist employs glazing and scumbling to alter and modify his tones, and why should not a photographer employ all methods at his disposal for the same purpose? Granted that the limitations of photography are great, it must be the photographer's aim to reduce them, and every day something is being done in this direction.

In the above remarks we have indicated something of the aims and the methods of the naturalistic school in the production of the negative, and when we turn to the subject of printing and reproduction we find remarkable advance, and a wide opening for the exercise of artistic taste, such as printing on matt surface and rough papers (not necessarily touched up, as Dr. Emerson says, by clumsy hands)—in fact, not touched up at all, but judiciously adapted to the subject when suitable. Again, bromide prints and enlargements, platina printing, and the numerous methods of producing plates and blocks for illustration, all point in the same direction, viz., the artistic representation of nature by means of photography. Let us, then, take courage and go forward, learning from success and failure, and ever remembering the witty Americanism, applicable to photography as to other matters, "Never prophesy unless you know."

CHAPTER IV.

PHOTOGRAPHY AND COLOUR.

“Mocking the air with colours idly spread.”

SHAKESPEARE.

THE subject of colour in art and science is one of extreme subtlety and difficulty. This arises from our very imperfect knowledge of the origin and nature of light, and of the chemical results it produces. To obtain photographs in the colours of nature has been the dream of experimental photographers for the last fifty years, and it may well be that it will take fifty years more before the problem is solved, if it ever be.

Let us consider shortly what colour is supposed to be. We know that Newton succeeded in dividing a ray of light by means of a prism into a number of coloured rays ; and it has since

been discovered that these coloured rays are transmitted to the retina of the eye in waves of different lengths, and with a varying but almost inconceivable velocity. For instance, of the extreme violet rays there are calculated to be 727 billions of vibrations per second, and of the extreme red rays 458 billions. The length of these waves has also been calculated in fractions of inches, and it has been found that the violet rays are the shortest and the red rays the longest. Every coloured ray, therefore, has its own wave-length, and each wave has its own rapidity. These waves, according to the undulatory theory of light, are supposed to be generated in an elastic, impalpable medium called ether, which pervades all space, even what we call vacuum. The movement of this ether is caused by the sun or other source of light, and on reaching the retina causes, we know not how, the sensation of light or vision. The sensation of colour, however, depends on the length and rapidity of the wave. It has also been dis-

covered that beyond the red end of the spectrum there are longer invisible waves possessing considerable heating power, and that beyond the violet at the other end of the spectrum there are shorter waves also invisible, possessing a great degree of chemical or actinic energy.

The colours produced by the analysis of light have for the sake of distinction been called *transient* colours, while the colours of all natural objects have been called *inherent* colours or pigments, and these have been defined as "the material basis which decomposes light so as to transmit only some of the coloured rays": for instance, a sheet of white paper reflects, roughly speaking, the whole of the rays, and produces what we call white; and if we cover the paper with a wash of any colour, say cobalt, then, roughly speaking, all the rays will be absorbed by the cobalt except the blue rays, and the result produced on the retina we call blue. All sensations of colour received from coloured objects are produced in this way, by the reflec-

tion of some of the rays and the absorption of others, the more transparent a colour is the more the rays are absorbed, and the more opaque it is the more they are reflected. The structure and surface, and the thinness or thickness of the coloured body also materially affect its capacity for reflection and absorption.

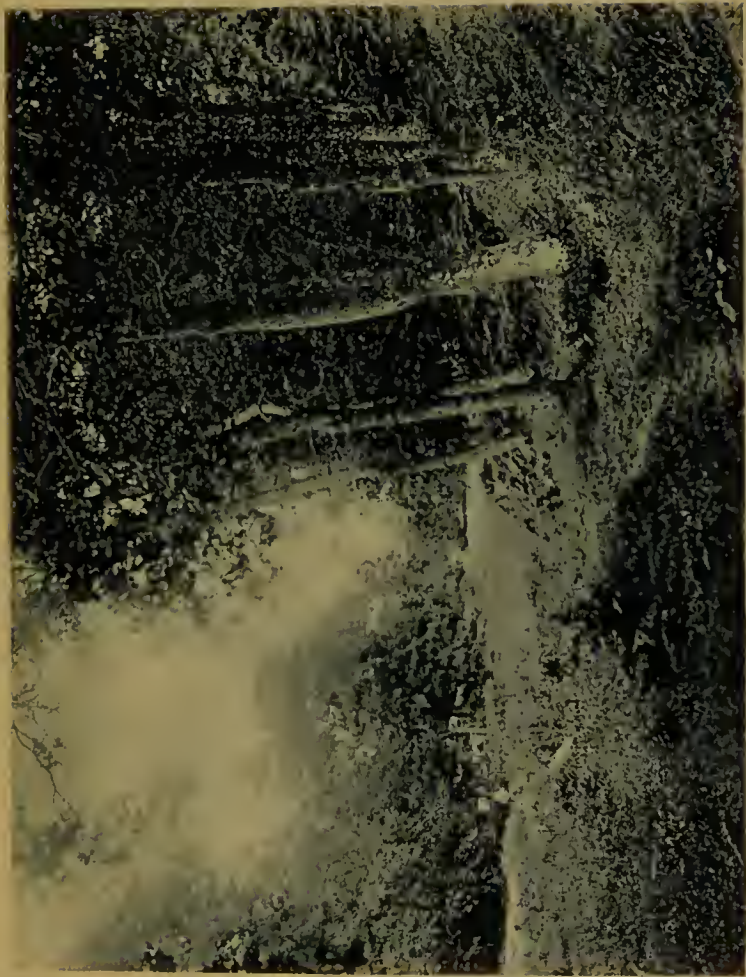
But what is the property of the object that enables it to reflect or absorb the particular rays? Here again we are at the end of our knowledge. It has been suggested that each ultimate atom is compounded with one or more atoms of oxygen or hydrogen, and that the fading of a colour is caused by the dissolution of this union, and that the colour, so to speak, rusts. Besides this, most substances in nature are composed of structural elements, called molecules, which are in turn made up of two or more (sometimes a great number) of dissimilar atoms. Thus each molecule of the colouring principle of carmine is composed of nine atoms of carbon, eight atoms of hydrogen, and five atoms of

.

oxygen, bound together, and the colour of carmine depends entirely on the intactness of these molecules. The reason of the bleaching of colours in sunshine is that each colour can only stand a certain amount of vibration, and the vibrations of the luminous ether in sunlight being much more rapid than those of ordinary daylight, the colours are, so to speak, shaken to pieces. Mineral colours consist of few atoms, while vegetable colours consist of many, hence the comparative instability of the latter. It has also been suggested that the retina consists of separate bundles of nerves susceptible to the different waves of colour, but anatomists have not hitherto been able to confirm this.

Let us now consider the problem of the production of natural colours on a photographic plate. When we look on the ground-glass screen in the camera, we observe an inverted representation in natural colours of the object or view before the lens. This is a mere reflection, produced according to certain well-known laws of

optics ; and if in place of the ground-glass screen we insert a plate, film, or paper coated with an emulsion of collodion or gelatine with bromide or nitrate of silver, and expose the same to the rays of light, and subsequently develop the latent image in a dark room, we obtain a negative picture in which all the lights are represented by shades, and the darks by spaces of more or less transparent glass. The light has in fact set up an action or rearrangement of the particles of silver out of which the image is subsequently built up or developed. In reality the film of silver has become more or less opaque where the light has acted. This action is so delicate that the faintest shades of nature are reproduced. But this beautiful light and shade picture is by no means accurate, and this is owing to the different effect certain colours in nature have upon the silver film. For instance, green and yellow and red objects appear in the print too dark, while blue and violet objects appear too light in tone. The reason of this is



THE EDGE OF THE WOOD.

that the actinic or chemical power of the sun's rays is not commensurate with the visual power. This to some extent can be remedied by the use of certain colouring matters in conjunction with the silver emulsion, and the objects of nature can thereby be reproduced in truer relation as to light and shade.

But there is no trace of colour in this, though it may be that some of these orthochromatic processes may hereafter lead to the discovery of the secret of the reproduction of colour ; but it is scarcely conceivable that silver emulsion can be so affected by any known substance as to reproduce and retain the hues of nature. For consider what the problem is : on the ground-glass screen there is a reflection, not of the primary colours simply, but a coloured representation, containing an endless mixture of colours acting and reacting upon each other in constant variety, and so producing the image of the scene. And how is the sensitive film to be so acted upon chemically as to reproduce these

innumerable variations of colour? Besides this, many substances which reflect the same tints to the eye may have a totally different power of reflecting or absorbing the actinic rays, so that the similarity they present to the eye may entirely disappear in the chemically produced picture. As we remarked before in the light and shade pictures, the chemical and the visual rays are not commensurate.

The following table gives a very good idea of the difference in activity between the visual and chemical rays, taking 1,000 as a maximum in each case :—

	Luminous (rays).			Actinic (rays).		
Dark Red . . .	0	.	.	0	.	.
Red . . .	32	.	.	5	.	.
Bright Red . . .	94	.	.	10	.	.
Orange . . .	640	.	.	50	.	.
Yellow . . .	1000	.	.	100	.	.
Green . . .	480	.	.	200	.	.
Blue . . .	170	.	.	500	.	.
Indigo . . .	31	.	.	1000	.	.
Violet . . .	6	.	.	650	.	.
Ultra Violet . . .	0	.	.	450	.	.

It will be seen from the above remarks that the difficulties to be surmounted in reproducing a coloured representation of a given view or portrait in the camera are enormous ; and we are not aware that any such has ever been produced up to the present time. It is quite true that the solar spectrum has been repeatedly produced in colours on silver plates, and an interesting account of the experiments of Seebeck in 1810, Sir J. Herschel and others, will be found in Mr. Hunt's "Manual of Photography," published so long ago as 1854. Fuller accounts of these experiments will be found in the papers contributed to the Royal Society by Sir J. Herschel in 1840, and in Hunt's "Researches on Light" (1854). The results, however, were uncertain and not capable of being fixed. M. Becquerel also has made a vast number of experiments with silver plates in connection with voltaic batteries, but the results produced were not true colours, but what are called colours of thin plates produced by interference of light, and analogous

to the deposits of oxides on the surface of metals. M. Becquerel states that plates prepared with iodide or bromide of silver will not give photographs in natural colours.

Mr. Meldola, in his "Chemistry of Photography," states that the result produced is an oxychloride, that the apparent resemblance to the natural colours of the spectrum produced in the film is an accidental coincidence, and that there is no physical connection between the vibration period of the ether waves and the colours assumed by the product ; and he adds, "of the chemical nature of these differently coloured products we know absolutely nothing." Colours of stained glass have also been reproduced on plates and paper more or less perfectly, but M. Becquerel does not appear to have discovered any method of fixing any of his coloured photographs. A very interesting article on the subject will be found in the "Year Book of Photography" for 1890. Mr. Robinson also claims to have obtained colours through coloured

glasses on an emulsion of collodion chloride of strontium and nitrate of silver, but the exposure required several hours to obtain the colours, and they do not appear to have been capable of being fixed. Captain Abney in 1880 proved that the production of the colours by photographic means resulted from the oxidation of the chloride of silver ; thus they are not true colours, but are due to the effect of interference of light.

M. Lippmann, of Paris, has also succeeded in reproducing the colours of the spectrum and colours of glasses ; these, he states, are produced on dry plates with a very fine grained film, and the light, which is a very strong one, is reflected from a mirror at the back of the camera after it has passed through the film. M. Lippmann claims to be able to fix these colours by ordinary methods. These coloured spectra have been exhibited in London ; and at a meeting of the Camera Club recently held, Captain Abney stated that he had been invited by M. Lippmann

to investigate his methods of working, and he adds, "I have seen his coloured spectra, and there is no doubt that the colours are due to interference, and are not what I may call true colours, since they vary according to the angle at which the plate is held, and they show next to none, if any at all, by transmitted light."

We are still, therefore, as far off as ever from the reproduction of the colours of nature in the camera, and it must be remembered that the so-called coloured results that have been produced have been obtained from the comparatively pure colours of the spectrum very highly illuminated, and with long exposures. Now, in photography from nature we have a condition of things totally different: the colours are all mixed together, and are largely contaminated, so to speak, with white light, the time of exposure is necessarily brief, and the illumination is comparatively feeble. When such men as Captain Abney, Mr. Meldola, M. Becquerel, and others, who have made thousands of experi-

ments with all known substances, tell us that with our present knowledge the thing is impossible, we are bound to bow to their superior knowledge ; and, however delightful it would be to be able to reproduce the colours of nature, for the present, at least, we must rest content with our black and white pictures ; yet not without hope that in the future further discoveries will solve this question, as they have in the past so many problems which were declared insoluble.

CHAPTER V.

LIGHT.

“Hail ! holy light, offspring of Heaven first-born.”

MILTON.

OF all the great powers of Nature, to a photographer, light is the most important and interesting ; and yet how little we know of its nature, its origin, or its effects ! But the study of photography has certainly taught us something of the nature of light. For instance, our photographic chemists have experimented with most known substances, and demonstrated the effects of light upon them ; opticians have improved and perfected lenses of all kinds to a remarkable degree ; while astronomers, workers with the microscope and the spectroscope, and others, have utilised photography largely as a recording instrument, and in some cases most

important discoveries have been made with its aid. Besides this, the extreme rapidity with which photographs can now be taken has given us a clearer idea of the enormous velocity of light than we possessed before. Even the vibration of an insect's wings and a bullet in its flight can be reproduced by the camera as if at rest, and shutters can now be constructed working at the enormous rapidity of $\frac{1}{500}$ of a second; but this is nothing compared to the rapidity of light, which has been calculated at 190,000 miles in a second, for in the $\frac{1}{500}$ part of a second, a space of time itself inconceivable, light would travel 380 miles.

We have also been able to analyse light into its component coloured rays, and even to measure the length and rapidity of each coloured wave. All this is very marvellous, but we are still ignorant of what light is. Newton imagined that it consisted of innumerable impalpable particles shot out from the sun—this is called the *corpuscular theory*; but Huyghens maintained that light

could only be explained by "supposing it to be a vibration-like sound"—this is called the *undulatory theory*; and Young and others have worked out this theory, and established it on a scientific basis; in fact, the undulatory theory alone accounts for and reconciles most of the facts that have been observed about light.

To support this theory we have to suppose that the whole of space, even what we call vacuum, is filled with an elastic invisible substance called ether, in which the waves of light vibrate. But what sets this ether in motion? This brings us to the source of light—viz., the sun; and it is supposed that this universal ether is kept in motion by the revolution of the sun on its axis. Scientific investigators have, by the aid of the spectroscope and of careful observations during eclipses, been able to make many important discoveries about the nature and composition of the sun. We now know that the sun is an incandescent body, having a diameter

of 882,000 miles, at a distance from the earth of 95,000,000 miles, and its light, travelling at the enormous rate of 190,000 miles a second, takes $7\frac{1}{2}$ minutes to reach the earth. These figures convey but little idea to the mind; but if we can imagine a circle twice the size of the moon's orbit round the earth, that circle would be about the circumference of the sun. The sun itself is surrounded with a luminous atmosphere called the photosphere, though of its nature and composition we know little, and during eclipses flames have been observed projected to a height of 40,000 or 50,000 miles.

There are also dark spots continually passing across the face of the sun, and these are supposed to be vast openings in the photosphere. These spots pass across the sun and reappear on the opposite side in a period of about 25 days, thus proving its revolution. They have been observed to be more frequent in some years than in others, and are supposed to be periodic, and influence the climate and heat of

our summers ; and this will probably account for the actinic power of the sun being greater in some years than in others. One of the most remarkable discoveries about the sun is that of the late Mr. Nasmyth, who observed that the surface of the sun consists of separated insulated objects of the shape of willow leaves ; and Sir John Herschell considered that these *organisms* were evidently the immediate source of heat and light. And these objects have been found to be each at least a thousand miles long and several hundred miles broad. The sun has also been weighed, and found to be considerably lighter than the earth, and the spectroscope shows that it contains most of the metals and gases familiar to ourselves. To return to the immediate subject of the sun's light. It is known that light increases in intensity, like the force of gravity, according to the square of the distance ; and as we are 95,000,000 miles away from the source of light, its intensity at the sun itself is simply inconceivable. And this wonderful light

is being thrown out on every side, rayed out into the infinite ; the merest fraction of it lights up our planetary system. What becomes of the rest? and how is this enormous furnace sustained? These questions may never be answered, but their consideration cannot but elevate our minds, and give us loftier ideas of that Divine Intelligence who said, "LET THERE BE LIGHT," and there was light.*

There are other immediate sources of light besides the sun, though no doubt they may all be ultimately traced back to his influence : for instance, heat, friction, chemical action, electricity,

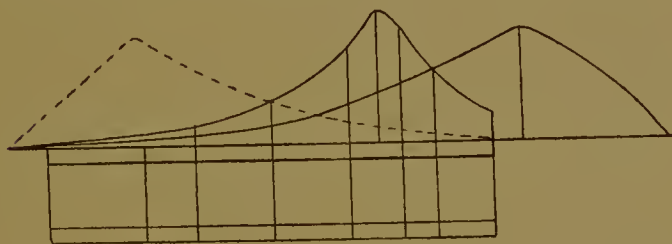
* A new theory has recently been started as to the nature of heat and light, which is enough almost to take our breath away, so novel is it—namely, that the sun radiates out not light and heat, but electricity, which develops into light and heat on meeting with our atmosphere, just as the current from a battery on meeting with the resistance of a platinum wire or carbon filament becomes incandescent. Direct electrical sun currents are supposed to come through the darkness and cold of space, and develop atmospheric light and heat at the moon, as well as at the earth ; and if this be so it would prove the existence of a lunar atmosphere.

the glow-worm, fire-flies, marine animaleulæ, certain plants, and decaying animal and vegetable matter. All bodies when heated to a certain point become incandeseent, and give out light ; in fact, heat and light are closely allied, both are supposed to be due to vibration, and both can be converted into motion. Professor Joule established the meechanical equivalent of heat, and Sir William Crookes by his radiometer showed that the direct rays of the sun will produce motion in a vacuum. Doubtless as our knowledge of the forces of nature increases the interdependence and correlation of all the physical forces will become more apparent.

But a ray of light, besides containing heat, also contains chemical or actinic power ; and it was discovered by Ritter in 1801 that this actinic power extended far beyond the violet end of the spectrum, just as Herschell discovered that the heat rays extended considerably beyond the red at the other end of the spectrum. We have therefore invisible chemical rays and in-

visible heat rays. The following diagram will explain this.

This shows that the visual rays and the actinic rays are not coincident, and this is one of the difficulties lens makers have to overcome, and so to combine their glasses and grind the surfaces as to bring the foci of the visual and



actinic rays as nearly as possible to the same point. In the above diagram it will be seen that the greatest chemical intensity is marked between the indigo and the violet of the spectrum ; but this varies according to the substance on which the light is acting : for instance, with silver chloride the maximum action is in the violet, but with silver bromide in the blue. All the coloured rays affect the silver plate in different

degrees, and this is one of the difficulties photographers have to overcome, as we have pointed out in the preceding chapters. All waves of light which effect decomposition in any body are called actinic, and the effect varies for every photographic compound.

It is with the actinic rays that photographers are chiefly concerned, and innumerable experiments have been made by Hunt, Herschell, Captain Abney, Professor Meldola, and others on various substances. The chemical action of light is extremely difficult to understand, but in Captain Abney's article on Photography in the last edition of the "Encyclopædia Britannica" will be found most valuable tables of the results of his experiments. There is also a most interesting article in Vol. II., No. 7, of the *Photographic Quarterly*, by Dr. J. J. Acworth, "On the Relation between the Absorption and Sensitiveness of Sensitised Plates."

But after all the researches into this subject scientists are not yet agreed as to the exact

chemical effect or result produced by light on the salts of silver. In fact, light produces some change on every object on which it falls. Chemical or electric action is set up, and in the case of the fading of colours and bleaching of substances a visible change is effected ; but doubtless there are many other invisible and chemical changes of the molecules of substances effected by the rays of light, which are so subtle as to escape our minutest investigations. Captain Abney, in his very useful work on Photography, states that ordinary white light "most probably consists of an almost infinite series of undulations of varying length, traversing a medium ; and it is quite conceivable that the molecules of a body whose oscillations synchronise with one of these series of ethereal waves may have their paths altered in form, and their amplitude increased to such a degree, that a rearrangement of the atoms must ensue."

Numerous actinometers have been invented, but most of them depend on the darkening of

silver paper to a certain standard tint ; but unless this shade is accurately related to the light in the camera and the plate we are using, they can be only of little value in the field, though for interiors or printing purposes they are more useful. Tables of the strength of the actinic light for all days and months of the year in all places have also been constructed ; but as these depend on so many varying factors they are not of much value to the practical man, who finds that the only reliable actinometers are experience and a good memory.

If, then, we ask the question, What is light ? the only answer that can be given is, that light is a sensation produced by the undulations of the ethereal fluids ; and these undulations originated by the sun or other source of light produce different chemical effects on the different bodies on which they impinge. We also know that these waves are compounded of other waves of different lengths and rapidities, which produce the effect of the different colours, that the most

rapid give the sensation of violet colour, and these produce the most marked chemical changes ; whilst the slower waves give the effect of red colour, and these produce the greatest sensation of heat, and between these two are the waves which produce the effect of yellow, and give the greatest sensation of light.

There are many other interesting properties of light, and some of them of great importance to photography, such as dispersion and interference, and the colours produced on thin plates and soap bubbles ; and these will be found explained and illustrated in most text books on light. (See Tyndall's lectures on Light ; also Sir John Herschell's lectures, and others.)

We have already pointed out in previous chapters of what immense importance to an artist are the effects of light ; but photographers seem to be little aware of this fact, and of how much their pictures may be improved by the addition of beautiful effects of light and atmosphere. Experiments with moderately quick

exposures will show what can be done in this way, especially looking towards the sun, which is always the most poetical aspect of Nature. The most effective pictures may be secured when the sun is partly hidden by clouds, or behind trees or buildings, and the results are so beautiful that no trouble should be spared to attain something of the mystery and atmosphere of Nature. Some of the photographs which illustrate this volume were taken under the sun by the seashore, when that luminary was partially obscured by clouds, with ordinary slow plates and exposures of about $\frac{1}{10}$ of a second.

If light is the most important matter for a photographer to consider, it is also the most beautiful, as it gives expression and life to the world around us, and, like the great artist that it is, decks the universe with its lovely colours, and while emphasising some facts, hides others in solemn mystery. The beauty and mystery of the light and the ever recurring dawn have been recognised by all nations, and many beau-

tiful myths have been created. The Greeks imagined that Aurora, the goddess of the Dawn, rose every morning from the ocean in her chariot drawn by the horses of Apollo, the Sun god, and, as Milton beautifully says,—

“ Morn,
Waked by the circling hours, with rosy hand
Unbarred the gates of light.”

And Tennyson, in his magnificent “Tithonus,” gives us glimpses of those “gleaming halls of morn,” and of the “wild team” which

“ Shake the darkness from their loosened manes,
And beat the twilight into flakes of fire.”

CHAPTER VI.

THE ARTISTIC USE OF A HAND-CAMERA.

"Paint your impressions."

TURNER.

MANY people seem to think that one camera can be made to serve all purposes. This is a mistake: a hand-camera should be used strictly as a hand-camera if the best results are to be obtained. Now, the very essence of a hand-camera is that it should be always ready, at "full cock," so to speak; it should be light, portable, and compact, simple and certain in the changing of plates; the shutter should be easily varied and not too rapid, the stops easily changed, and the finders over the lens and identical. We assume, of course, that the lens is a rapid R.R., of about 5 inches focus.*

* For artistic views a landscape or single lens is far prefer-

There are many cameras on the market which embrace all these requirements, but most of them are expensive, running up to £8 and £10. Still, a good instrument is well worth the money, and will save much worry and disappointment.

Now, we dismiss at once all hand-cameras which change the plates by means of dark slides or bags. This cuts out a good number. The changing arrangement should be by a simple screw or turn of a lever, and there must be no turning upside down or thumping before the machine will work. The plates will be held in sheaths, and Miall's patent sheaths are admirable, though it is very much to be desired that, by means of a dyed film, sheaths could be altogether dispensed with. Plate makers also should be more careful as to the uniformity of the size and thickness of their plates, as nothing is more aggravating than to be stopped by a

able to a doublet, and a well-made camera should be able to take either at pleasure, and should also contain an arrangement for focussing the view.

jam in the camera, and perhaps a whole afternoon wasted in consequence. Assuming, then, that we have a camera possessing the above requirements, let us consider how and for what purpose we should use it. First of all we must steadily set our faces against promiscuous "pot shots" at anything or everything. These things will only amuse children and idiots, whose ambition appears to be satisfied when they have secured a negative of a railway express.

No; the uses of a hand-camera to an artistic worker are very different. He will be chary of letting off his shutter till he gets the exact thing he wants—no easy matter. For his real aim is to secure an artistic impression of nature which may help him in his work, and which is often as fleeting as the ocean foam. For instance, in a portrait or head, how difficult it is to catch the desired expression, which, perhaps, may only occur at very long intervals, and must be secured, when it does occur, on the instant! And the same with attitude and gesture,—how

often a picture may be made or marred by the turn of a head or an arm ! For these things we must watch and wait with our finger on the trigger. What beauty, too, and grace there often are in the unconscious attitudes of children at their play, or of men at their work, or of old age in its repose ! These things must be secured instantaneously if at all, and the same remark applies to the photographing of birds and animals, which are often extremely graceful and humorous. But these graceful, unconscious attitudes and expressions must, as the advertisements say, "be seen to be appreciated," and most people go through the world practically blind to the beauty that is everywhere around them. An artist is ever on the watch for these things, most of them as fleeting as the "snowflake on the river" ; and as from experience he knows what will make a picture, so from the study of the best examples of art, such as the frieze of the Parthenon and the works of the old masters, he is able to seize on a graceful

attitude or expression at once. His mind, as Wordsworth beautifully puts it, has become "the mansion of all lovely form." And surely the hand-camera must be of immense service to such a student. It is much to be desired that plates could be made even more sensitive than they are, so that instantaneous photography could be secured indoors and in a feeble light.

But it is, however, for the study of landscape effect that the hand-camera is most valuable. Now, here there is a wide field for the artistic worker.

Every artist worthy of the name knows that effects of light and shade are the very life of nature ; and their reproduction is at once his aim and despair, and he will spare no effort, by rapid sketching and pencil notes, to secure even some faint image of their beauty. At the best he has to rely largely on his memory, so rapid are the changes of nature ; and here a hand-camera is of immense service, as the most

beautiful clouds and passing gleams can be secured. For cloud photography alone, a hand-camera is invaluable, as no human work can at all approach the truth of form and mysterious subtlety of a good sky, and a collection of clouds, from the higher cirrus to the low stratified nimbus, is of immense interest and value to an artist. Cloud photography, too, has this advantage, that it can be carried on in the winter, and at all times, except in dull weather. Some of the best effects are to be obtained after a gale or thunderstorm, when the weather is clearing up, and in the evening, looking to the west, when the sun is just behind the clouds ; with a low horizon or the sea, splendid effects can be secured. Besides this, in ordinary landscape views the quick exposures of a hand-camera will always secure the sky, and, if it happens to be a good one, may be the making of a picture out of a very ordinary scene. This is far better than the usual method of printing-in skies ; even when well done, the process is

troublesome, and the results are seldom successful, and often ridiculous.

In the fifth volume of Ruskin's "Modern Painters" will be found an exhaustive and masterly study of the sky, and some of the descriptions are as gorgeous and full of the splendours of sunset as a Turner picture.

In photographing skies or landscapes with a hand-camera the most important matter is the light, and it is of no use to attempt it on dull days, or under trees, or in shady places; and in the latter months of the year advantage should be taken of the morning light, as the actinic power falls off rapidly after midday.

Another fascinating branch of work is the sea and waves in motion; the truth of the representation of the falling wave and the lace-like wash of the foam is something wonderful, and will well repay some trouble. There are few, very few painters who have succeeded in reproducing these effects, even passably. It is no easy matter to hold a hand-camera steady in

a gale of wind, and as you must get as close as possible to the waves, you must not mind wet feet, but *finis coronat opus*, and some of the enlarged sea studies are the finest things that the camera has produced.

Again, for studies of detail, how invaluable is a hand-camera! By its aid the artist can secure the shape of weeds and grasses, the growth and branching of trees, the structure of rocks, and numerous other things, which will materially assist him, if not by their exact representation in his picture, at all events by adding to his mental stock of natural form from which he draws his supply, and which he idealises when reproduced in his finished work. Another use to which a hand-camera may be put is in securing figures and groups of cattle and birds to be introduced into pictures; these are very valuable, and many a good idea may be got by a little observation while at work, and may be the making of a picture. For boats and ships in motion, of course, a hand-camera is

indispensable. But we think the best purpose to which it can be applied is in securing as far as possible something of those passing effects of light which are so supremely beautiful, and which give such an expression to the face of Nature ; and this beauty will be found not only in the grandeur of storm, but in the quiet, unobtrusive passages of calm evenings, when earth and sky are wrapped in the repose of twilight. Such are some of the uses to which a hand-camera may be applied. In the hands of thoughtless, uneducated persons it no doubt deserves all the opprobrium that has been heaped upon it, but in the hands of intelligent artistic workers it is a most interesting and valuable aid in the study of nature and the appreciation of her endless charm.

CHAPTER VII.

COMPOSITION.

“Order is Heaven’s first law.”

POPE.

IT is a hopeful sign for photography that its professors are beginning to think and talk of art and artistic rules, and that efforts are being made to produce more artistic results than have hitherto been attained. In the following chapter we propose to explain briefly the principal rules of composition, which has been defined by Mr. Prout as “the grouping and arrangement of pictorial materials to express the unity of an entire expression”; and by Mr. Ruskin, in “Modern Painters,” vol. v., as “the law of help,—the help of everything in the picture by everything else.”

And again in his “Elements of Drawing,”

“Composition means literally and simply putting several things together so as to make one thing out of them, the nature and the goodness of which they all have a share in producing. Thus a musician composes an air by putting notes together in certain relations ; a poet composes a poem by putting thoughts and words in pleasant order ; and a painter a picture by putting thoughts, forms, and colours in pleasant order.” The result of good composition is unity, and is the direct reflection of the genius of the painter, the poet, or the musician on his finished work.

Now, composition can no more be taught than the art of painting a Turner picture or composing a Beethoven sonata ; but, nevertheless, as rules of composition are generalisations from the works of great artists, these works, on examination, will be found to conform to certain well-known rules. There are, however, certain simple arrangements and combinations which should be thoroughly known, and which will materially assist the student. It must not, however, be

supposed that every picture will contain examples of all the rules of composition, or that in the works of the great masters any rule will be too prominently forced into notice ; the object of art is rather to hide the means by which the effect is produced.

The first great rule may be thus expressed :—

I. *Every picture must have one feature more important than the others, which must group with it in subordinate positions.*

This is called the law of *principality*, and is exemplified by having some idea, group, light, or mass of colour more prominent than all the rest, and ruling the others into subjection. The greatest care, however, will be necessary, in applying this or any other so-called rule of composition, not to make it too prominent ; it should be suggested rather than insisted on, or the modesty of nature will be overstepped.

II. *Every principal idea, group, or combination should be repeated by some subordinate idea, group, or combination.*

This is called the law of *repetition*, and by it unity is expressed, one passage faintly echoing another. The repetition must, however, always be an echo merely ; otherwise it will be difficult to decide which is the principal group, and the desired effect will not be produced. This repetition, if skilfully effected, will express repose. Reflections in calm water will illustrate this rule. If the groups or ideas are too much alike, the effect of symmetry will be produced, which Nature always avoids.

III. *A number of objects, more or less similar, should be represented in orderly succession.*

This is called the law of *continuity*, and may be illustrated by the arches or pillars of a cathedral retiring in perspective, or by clouds or mountain-ranges retiring in appointed order. Turner was very fond of the retiring arches of bridges, and made great use of this law of continuity : see his " Rivers of France " for examples of this.

IV. *Obiects in continuity should, if possible, be*

in curves, rather than in straight or angular lines.

It should be noticed that all natural curves are very subtle, and do not form any part of a circle. Graceful curves are also varied and modulated by numbers of subordinate curves; in fact, the beauty of all lines and colours depends in great measure on their delicate and subtle modulations. Examples of beautiful curves may be seen in nets at sea, or the lines of bays and river banks, or the flight of birds and the form of their wings.

V. *There are two kinds of harmonious lines in composition—viz., parallel opposing or intersecting lines, and lines radiating from or converging to some centre.*

Both these kinds of lines are seen in good compositions and in Nature. Trees and shrubs radiating from one root are a striking example of the second class; and it will be found that in most cases there is a mathematical centre of

curvature of the branches, which regulates the shape of the whole tree.

VI. *Every colour, line, or form may be made more striking to the eye by the juxtaposition of an opponent colour, line, or form.*

This is the law of *contrast*, and is one of the most important laws of composition. The mind enjoys everything more by dwelling also on its opposite ; thus warm colours are set off by cold colours, light by darkness, curved forms by straight, and so on. The combination of these contrasts in a picture requires the greatest knowledge and feeling ; a too violent contrast defeats itself, and is the mark of bad work. Great painters, delicate in this as in all else, “do not commonly admit violent contrasts ; they introduce it by stealth, and with intermediate links of tender change.” Contrast is one of the most powerful weapons the artist possesses, as by it he may bring all the parts of his picture into harmony and proper relation,—some parts, for instance, he will leave purposely uninteresting

so as to enhance the interest of some other part ; and the same with finish. This appears to be one of the stumbling-blocks of the extreme realistic or pre-Raphaelite school, and their labour is in a great measure lost, as it is equally expended on every object in the picture. A good painter will know when to stop his hand, and give the spectator a change to some other kind of pleasure ; as Mr. Ruskin beautifully puts it, “ He gives a passage of rich, involved, exquisitely wrought colour, and then passes away into slight, pale, and simple colour ; he paints for a minute or two with intense decision, and then suddenly becomes, as the spectator thinks, slovenly. But he is not slovenly ; you could not have taken any more decision from him just then,—you have had as much as is good for you. He paints over a great space of his picture forms of the most rounded and melting tenderness, and suddenly, as you think by a freak, gives you a bit as jagged and sharp as a leafless blackthorn.”

This law of contrast is perpetually varied and modulated by another law, called the law of *interchange*, which gives to opposite things a portion of the character of the others, and by this the contrast is prevented being too startling or prominent. In Nature it may be continually noticed how the darkest shade is flecked with light, and the brightest light broken up with points of shade. But in good compositions there is an appointed order in this, as in all else ; the result to be produced is unity and harmony ; and as every star burns in its appointed order, and every blade of grass springs in its appointed place, each in harmony with each, and in subjection to the whole, and that whole the perfect composition of this universe, so in the work of a great painter each line and colour falls pre-determined into its appointed place, completing and compelling the unity and beauty of the whole. There are doubtless many other subordinate rules of composition, but those above mentioned are the leading principles, which the

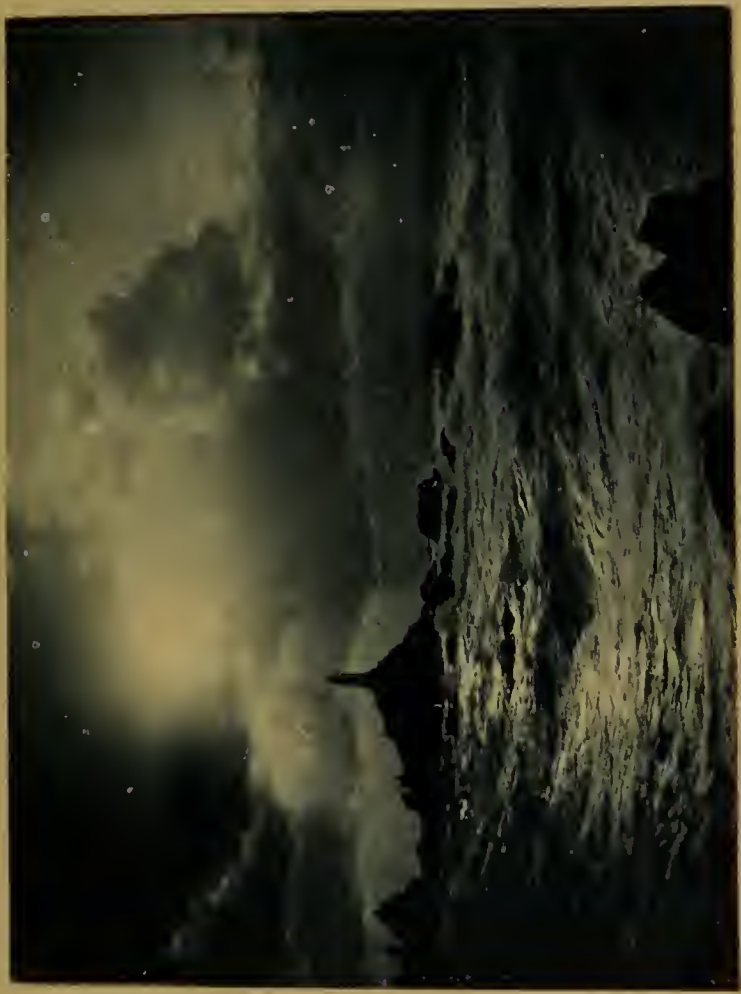
student will do well to bear in mind, and endeavour to employ in his own pictures, and to trace out in the works of the great masters.

As the hand gains power and the eye delicacy, they will compose naturally without effort, just as a poet or a musician does ; for the refined taste and educated eye will not endure harsh forms or glaring contrasts or crude compositions.

After all said and done, the subject is one beset with difficulties, and affords the widest scope for difference of opinion. Sir Joshua Reynolds, whose lectures contain a mine of wealth, makes the following remark on this subject : " Composition, taken generally, is the principal part of invention, and is by far the greatest difficulty the artist has to encounter. Every man that can paint at all can execute individual parts, but to keep those parts in a due subordination as relative to a whole requires a comprehensive view of the art that more strongly implies genius than perhaps any other quality whatever."

Another writer on art, Mr. Prout, in his valuable work on "Light and Shade," gives the following brief but comprehensive rule for composition: "The best practice is to form one broad mass, to keep other masses quite subordinate, and to avoid equal quantities."

As a general rule, it is well to avoid one object placed over another, or seen through another; and in sketching from Nature time is well spent in trying for the best possible composition, and the more advanced the artist is the more difficult he will find it to be satisfied. Practice alone will show how the straight lines of mountains and plains may be opposed to rolling clouds and rounded masses broken up by angular rocks and other forms. The sky should always be treated with a view to the composition of the picture. For instance, if the subject is a very full one, and contains much action, a quiet sky will be required; but if the landscape is flat and somewhat uninteresting, then the sky should be made more prominent.



A PASSING SQUALL.—JERSEY.

The introduction of groups of figures and cattle, flocks of birds, etc., may greatly help the composition ; also roads leading into the picture and shadows of clouds passing over the landscape or across a road are most valuable assistants.

The study of the works of great painters of all schools will be of the greatest service to the artist ; and among the modern painters of landscape we would especially advocate the close study of Turner, in whose pictures, especially in the " *Liber Studiorum* " and his other engraved works, all the principles of composition will be found fully illustrated in a way and with a variety no artist has ever attempted.

The study of these masterpieces, and also of the writings of Reynolds, Burnet, Prout, Ruskin, and others on the subject, will be of the most material value to the thoughtful worker, and will fill the mind with noble images, reflections of the Eternal intelligence, which will be, if rightly used, among its dearest possessions.

CHAPTER VIII.

LIGHT AND SHADE.

"Nature is economical. She puts her lights and darks only where she needs them."

W. HUNT.

THE study of light and shade is of paramount importance to the artist and photographer. Composition teaches us the building up and construction of a picture, but it is the lighting of it that gives it its expression. One of the chief difficulties the photographer has to contend with is the suppression of unnecessary or undesirable objects and detail. The artist simply omits them, and chooses his time of day when the shades of evening give a breadth and solemnity to an otherwise ordinary view, or he catches the cloud shadows sweeping over the landscape and across the road, and by this

means secures truth and variety ; and the photographer must do the same. He must watch and wait ; his eye must be ever on the alert for combinations and effects ; he must choose his subject and his time, and come again and again, taking cheerfully the spoiling of his plates, if so be he may obtain the desired result.

Of late years we have heard a good deal about *values*—a word borrowed from the French, and intended to express the relation of the light and shade of the different planes of an object or view to each other. Now, it should be observed that there is no such thing as *absolutely correct* light and shade either in painting or photography, and that is because the means at our command are not adequate. For instance, flake white compared with sunlight is a dark grey ; and our deepest black is many degrees lighter than the blackness of nature. The artist has therefore to work by an artificial scale, and his representation of nature's scale of light and dark is but a compromise and suggestion at the best.

This would be difficult enough if the world were a black and white world, but the colours of nature complicate the problem enormously.

The artist, therefore, has to consider and allow for the differences of luminosity in the coloured world ; but there is a further difficulty yet. Pure colours are rarely met with in nature, except in the foreground, but are largely mixed with white light, and are further complicated with reflected lights and atmospheric conditions. But it is this very complication that produces the subtle beauty of nature's colouring. It is not in the gaudy primary or secondary colours that this beauty is chiefly found, but in the quiet, subdued harmony of the tertiary colours, the russets, the olives, and the citrons. And these tertiary colours pervade Nature in her every phase, and the more delicate the eye becomes, the more it will take delight in these refinements of colour. Mr. Field, in his valuable work on colour, says with great truth : "To understand and relish the harmonious relations

and expressive powers of the tertiary colours requires a cultivation of perception and a refinement of taste for which study and practice are necessary. They are at once less definite and less generally evident, but more delightful, more frequent in nature, but never in common art, than the like relations of the secondaries and primaries."

From the above it will be seen that the artist has first to adapt his narrow artificial scale to the vast scale of natural light and shade, and then he has to take note of and allow for the variations produced by the endless play of colours acting and reacting upon each other, and perpetually altered by changing atmospheric conditions.

Nothing but years of unremitting study, combined with great natural abilities, will enable the artist to grapple with the difficulties above mentioned.

The photographer has his own further difficulty to contend with—viz., the variations of the

actinic power of light, which is not commensurate with the visual power. To some extent this can be overcome by the use of orthochromatic plates and coloured screens, and the colours of nature are then represented in truer value as to tone.

The above remarks will show the difficulties attending the production of pictures in black and white ; and though great theoretically, yet in practice it is found that very fair reproductions in light and shade can be obtained. For instance, studies of still life—and these are of especial value to the student—can be produced with marvellous fidelity ; and sunlight, moonlight, and atmospheric effects can be *suggested* with great success.

In his valuable work on Light and Shade Mr. Prout says : “ The characteristics of moonlight are the essential requisites of good effect, such as concentrated brilliancy with smaller glittering lights, large masses of shadow and a point of light opposed to the deepest shade,

while all the minor details become invisible and sink into the simplicity and grandeur of the whole."

As photography does not enable us to take views by moonlight, we must be content with studying the effect in nature, and endeavour to imitate it with brush and colour. This, and the careful study of still life, will be found most useful, and will educate the eye to appreciate the true "values" of the various planes. Rules are of little or no value; the secrets of nature and art are only to be learnt by careful study and observation, and also by comparing and contrasting the works of great painters, especially those of Rembrandt and Turner. Much, too, may be learnt by the careful study of the lighting of natural objects, and the time of day and atmospheric effects.

In early morning and at twilight the landscape will assume a breadth and repose which will hide many objectionable details and greatly assist in the production of artistic work. Again, on

cloudy, windy days, the broad shadows sweeping over the landscape are suggestive of most poetical effects. The photographer who refuses to stir out on a windy day will never produce artistic work, for, as Dr. Emerson well says, "Æolus is the breath of the life of landscape." Turner on one occasion, when asked by a brother artist what to paint, replied, "Paint your impressions"; and here photography is of immense use, as it can seize an effect of nature in the twinkling of an eye, and can catch the wave in its fall, or the bird on the wing, or the shadow sweeping over the mountain side. An artist has to rely largely on his memory; and Nature is so various in her effects and changing lights that he is constantly tempted to change his purpose, instead of relying on his original impression. To catch these fleeting beauties of nature, a hand-camera is of great assistance, as it is always ready, and is an inestimable boon to the artistic worker. Every artist and photographer should master the working of a hand-camera, for it is most

useful as supplementary to his ordinary work ; but, like every other good thing, it requires patience and practice before the best results can be obtained.

Next to the study of nature should be placed the study of the works of the great masters, and sketches in black and white of their arrangement of light and shade will be of the greatest use. Sir Joshua Reynolds adopted this plan on his travels through the foreign galleries, with doubtless great advantage to his work, and in his notes upon Fresnoy's " Art of Painting " he relates his method of procedure as follows :—

" The means by which the painter works, and on which the effect of his picture depends, are light and shade, and warm and cold colours. That there is an art in the management and disposition of those means will be easily granted, and it is equally certain that this art is to be acquired by a careful examination of the works of those who have excelled in it.

" I shall here set down the results of the

observations which I have made on the works of those artists who appear to have best understood the management of light and shade, and who may be considered as examples for imitation in this branch of art.

“Titian, Paul Veronese, and Tintoretto were among the first painters who reduced to a system what was before practised without any fixed principle, and consequently neglected occasionally. From the Venetian painters Rubens extracted his scheme of composition, which was soon understood and adopted by his countrymen, and extended even to the minor painters of familiar life in the Dutch school.

“When I was at Venice, the method I took to avail myself of their principles was this: when I observed an extraordinary effect of light and shade in any picture, I took a leaf of my pocket-book, and darkened every part of it in the same gradation of light and shade as the picture, leaving the white paper untouched to represent light, and this without any atten-

tion to the subject or to the drawing of the figures. A few trials of this kind will be sufficient to give the method of their conduct in the management of their lights. After a few experiments I found the paper blotted nearly alike. Their general practice appeared to be, to allow not above a quarter of the picture for the light, including in this portion both the principal and secondary lights ; another quarter to be as dark as possible ; and the remaining half kept in mezzotint or half shadow.

“Rubens appears to have admitted rather more light than a quarter, and Rembrandt much less—scarce an eighth ; by this conduct Rembrandt’s light is extremely brilliant, but it costs too much ; the rest of the picture is sacrificed to this one object. That light will certainly appear the brightest which is surrounded with the greatest quantity of shade, supposing equal skill in the artist.”

Although we said above that rules were of little use, meaning thereby hard-and-fast rules,

still there are certain broad principles which should be thoroughly understood : for instance, the lights should not be scattered all over the picture, or the idea of unity and breadth will be destroyed. "The opposite quality to breadth, that of division or scattering of light and colour, has a certain contrasting charm, and is occasionally introduced with exquisite effect by good composers. The broken lights in the works of a good painter wander like flocks upon the hills, not unshepherded, speaking of life and peace : the broken lights of a bad painter fall like hailstones, and are capable only of mischief, leaving it to be wished they were also of dissolution" (*Ruskin*). Breadths of shade should, if possible, be linked together by other accidental shadows ; and this recalls the old story of the artist who was asked what the dog was doing in his picture. "Why," said he, "he is carrying the light and shade through it."

Again, if there is a leading idea or object in the picture, the light and shade should be

arranged so as to display it most effectively ; and yet it must be so insensibly linked together with the rest of the picture as not to be obtrusive. All this is difficult enough ; but as the artist progresses in his study of nature and art, new beauties will gradually unfold themselves, and every success will be a stepping-stone to greater success, and every failure but an incentive to future effort. To the artist who works in this spirit, either with the brush or the camera, every picture will present a new and interesting problem, new difficulties will but incite him to further exertion, and as his skill increases and his study of Nature leads him to understand and interpret her most subtle moods, he will perceive that the beauty of Nature is inexhaustible, and that all human effort and work must fall infinitely short of his ideal, and that life itself is all too short to record even a fraction of the beauty and mystery around him.

CHAPTER IX.

PERSPECTIVE.

“Fine by degrees, and beautifully less.”

PRIOR.

THE knowledge of the rudimentary principles of perspective is essential to the artist and the photographer. It has been defined by Mr. Prout as “the art of representing natural objects upon a plane surface in such a manner that the representation shall affect the eye in the same way as the objects themselves.” As a rule, an artist is guided by his eye alone, but an architect must be thoroughly grounded in the higher principles of perspective. Many of these cannot be applied to landscape painting; but as a matter of fact all that is essential for a landscape painter “lies within a few simple

rules which may be readily and easily comprehended, and when once acquired can never be forgotten." We purpose in the following chapter to explain and illustrate the essential points of linear perspective.

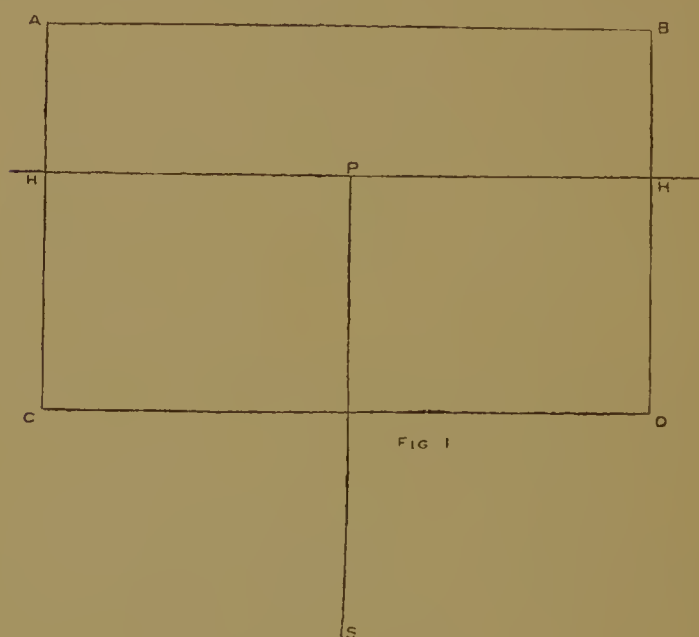
1. The plane of the picture is that portion of the landscape represented on a vertical surface, such as a sheet of paper or glass, and enclosed by its bounding lines. The lateral extent of this plane is regulated by the subject, and varies from sixty to eighty degrees of the circumference of a circle.

2. Perspective may be divided into *parallel* and *angular*.

An object is in *parallel* perspective which has one side the lines of which are parallel to the spectator, and the lines of the other sides receding from him, such as a square box or the interior of a room.

An object is in *angular* perspective when both its sides recede from the spectator, such as the angle of a house.

3. The position of the spectator is called the *point of station*, and the spot on the horizon exactly opposite to the spectator's eye is called the *point of sight*.



4. A line drawn through the point of sight parallel to the top and bottom of the picture is called the horizontal line. This imaginary line *moves with the spectator*; in fact, as has been well

said, he carries the horizon line with him. The following diagram will make these points clear.

A, B, C, D, are the limits of the plane of the picture, S is the point of station, P is the point of sight, and H H the horizontal line.

5. The horizontal line may be high or low, according to the position of the spectator—high, if he is looking down on the view as from a hill or tower ; low, if his eye is near the surface of the earth.

6. The point of sight may be at any part, but must always be on some part of the horizontal line, but not necessarily in the plane of the picture.

7. Every object apparently diminishes as it recedes into the picture, and in parallel perspective the receding lines of all such objects will incline or converge to the point of sight. The lines of all objects below the eye will rise up to this point, and those above the eye will fall down to it. The interior of a room, Fig. 2, is the simplest example of parallel perspective.

8. In *angular* perspective both the sides of objects or houses recede from the spectator.

9. The points to which these lines recede or vanish are called the vanishing points; these

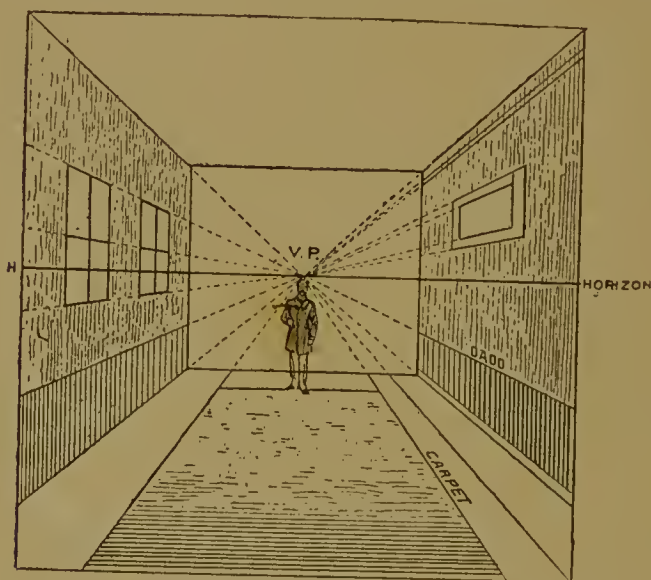


FIG. 2.—V.P.=VANISHING POINT, OR POINT OF SIGHT.

points may or may not be in the plane of the picture, *but are always on the horizontal line.* The position of these vanishing points varies according to the position of the spectator, and the angle at which the object is viewed. It will

therefore be seen that in both angular and parallel perspective the line that governs the picture is the horizontal line.

10. There are also mathematical rules for measuring the lines which recede into the picture, and for fixing the position of the vanishing

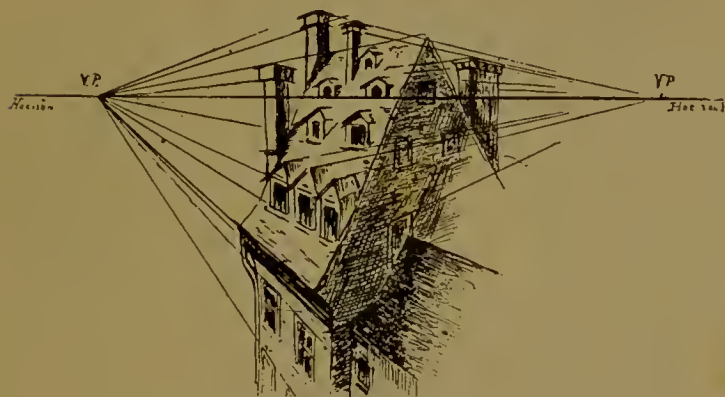


FIG. 3.—ANGULAR PERSPECTIVE.

points ; but as this depends upon the distance of the spectator from the base line of the picture, namely, the point of station, which is quite arbitrary, it is unnecessary to trouble the reader with them, as they could only be used in making architectural drawings by measurement.

In drawing a building in angular perspective the student must draw by his eye the base, or some receding line, in the direction it takes up or down to the horizontal line, and the point at which it would, if continued, intersect the horizontal line will govern every line on that side of the building which recedes into the picture. "The great principle to be kept in mind," says Mr. Howard, "both as regards angular and parallel perspective, is that *all lines inclined from the surface, or receding into the picture in the same direction, or parallel with each other, must be drawn to the same point, and that point must be on the horizontal line.*"

11. Circular objects drawn in perspective will appear more and more elliptical, according to their distance and position.

12. In the representation of uphill or downhill views it is useful to draw two lines across the picture, one the ordinary horizontal line, the other across the top or bottom of the hill, as the case may be ; then all horizontal receding

lines in the plane of the picture will vanish on the horizontal line, and all lines following the plane of the ascent or descent will vanish in the second line, such as ruts or trees lying by the roadside.

13. The elementary principles of perspective may be successfully applied by the artist or photographer in constructing his picture, and will materially assist the completion of the desired effect. The sky, for instance, should be considered as a plane extending over the surface of the earth, and meeting it at the horizon line, as the ceiling of a room extends over the floor, it should not therefore be represented as a flat surface, but should recede into the picture. Clouds, too, all follow the laws of perspective, the eye of the wind being the point to which they generally converge ; they should also be made to recede into the picture, cloud behind cloud, till the lowest ones appear to be miles away in the distance, whilst the highest ones are over the spectator's head.

The perspective of mountains is not so apparent, but it may be traced in distant ranges.

14. In all cases perspective is most useful in enabling us to express the appearance of objects receding into the picture ; this gives space and reality to the subject, and avenues of trees, streams, roads with their ruts and tree-trunks, hedges and walls, and other objects may be most successfully used for this purpose. Of course it must be done skilfully ; the means must be hidden, and the result only shown.

The works of Turner, Cox, Prout, Harding, and others show the great use they made of roads, trees, walls, and other objects to lead the eye into the picture.

For the same purpose lines of cattle, boats, birds, and figures, waves on the shore, etc., may all be of the greatest use in assisting the perspective of the picture, and the master hand is at once apparent in the manner these resources are applied.

15. "Aerial perspective," as it is sometimes

called, is not dependent on lines, but "consists in the modulation of the brightness and colours of objects in accordance with the state of the atmosphere, the depth of the body in the perspective planes, and other accidents of time and place."

16. It will therefore be seen what an important part linear and aerial perspective play in the composition and execution of a picture ; their office—and a most important one it is—is to regulate the distances, and to throw each part into its proper place. The subject is well worthy of the artist's attention, but, as Mr. Ruskin says, "Its laws are too gross and too few to be applied to any subtle form." This is undoubtedly true ; but the knowledge of the plainest of those laws must be of material assistance in all artistic work.*

* Dr. Emerson and Mr. Goodall have recently issued a pamphlet entitled "Notes on Perspective Drawing and Vision" (see *Amateur Photographer*, June 19th, 1891), in which they endeavour to prove that "for scientific reasons the accepted rules of monocular perspective are likely to mislead the artist,

and prove the fallacy of photographs and all mechanical methods of measurements. The reason we get a different impression of relative sizes of objects by normal vision from that given by mathematical perspective drawings and photographs is, that the combination of these properties of vertical and horizontal visions gives quite a different result to that of perspective drawings. Having shown how we see forms, it only remains to say that a mathematical perspective drawing, or the drawing of an aplanatic photographic lens, does not give forms as we see them. They are altogether false to the visual impression of the proportions of things, and therefore give a wrong idea of the original scene. On the other hand, a perspective drawing or correct photograph gives the *actual facts* scientifically. All such drawings are therefore purely scientific diagrams, and artists who wish to render what they see must not rely upon them." Captain Abney does not endorse the opinion of Messrs. Emerson and Goodall. He said, at a recent meeting of the Camera Club, that "after examining a great deal of artistic perspective he could say it was false, whereas photographic perspective was mathematically correct." (*Photographic Quarterly*, July 1891.)

Dr. Emerson, however, returns to the charge in his article in the January number (1892) of the *Photographic Quarterly*, "Photography, not Art," and maintains that his "investigations easily explain why photographs so often do not resemble the people they are meant to represent; why landscapes are nearly always so disappointing and petty, and why architectural photographs are useless to the seeing draughtsman." We should have thought it was rather a matter of using suitable lenses than anything else; but no doubt the subject will receive further investigation.

CHAPTER X.

PHOTOGRAPHY AND SCIENCE.

“Science is measurement.”

ONE of the great charms of photography is that its pursuit leads us into so many different fields of study. On one side it is closely connected with art, both fine and industrial, and on the other its relations with science are equally intimate. It may well be called the child and handmaid of both. Let us consider the scientific aspects of photography. In these days so much is done for the practitioner in the way of ready-made plates, developers, and printing papers of all kinds, that the present generation are inclined to take the “goods the gods provide them,” asking no questions, ignorant or regardless of the fact that these very plates,

papers, and solutions are the result of the work and discoveries of at least fifty years. In the early days of the art it was not so ; thirty years ago we had to do nearly everything for ourselves, from the cleaning of the glass to the sensitising of the printing paper, and much was learned in the process. It is very interesting to look through the earlier works on photography, such as Hunt's " Manual of Photography " (1854), and to trace the gradual growth of the art through the experiments of Niépce, Fox Talbot, Daguerre, Sir John Herschel, and others, and to see how, from small beginnings, the art of photography has been evolved, and how the chain of discoverers has never been broken. Inventors and men of science have handed on the torch from one to another, still the procession goes on, and who can foresee the ultimate goal? See how all the resources of science have been pressed into the service of photography. Opticians have produced for us lenses of innumerable variety and great perfection. Mechanics have con-

structed cameras, actinometers, and shutters of the greatest ingenuity ; while chemists have given us plates and films most marvellously sensitive to light, and have ransacked the world of Nature for substances to develop the latent image, and to fix and print it on paper and other substances. An immense number of animal, mineral, and vegetable substances have been pressed into the service, such as gold, platinum, silver, lead, aluminium, copper, iron, mercury, potassium, uranium, magnesium, and their salts and oxides ; gelatine, gun-cotton, ether and alcohol, acids and alkalies of all kinds, vegetable dyes and extracts, all have been laid under contribution, and have materially assisted in bringing the art to its present position.

The laws of optics and light have been closely studied, the actinic and luminous powers of the spectrum carefully measured, and fresh discoveries made as to its constitution and the actinic power of the non-luminous rays ; the rapidity and wave lengths of the coloured rays

have been calculated, and have made manifest to us somewhat of the almost inconceivable rapidity of light. The chemical power of light has been measured by actinometers in all seasons and quarters of the globe, elaborate tables have been prepared for our use, and our plates are now prepared, and their degree of sensitiveness accurately adjusted to our requirements and to the light at our disposal. By the means of electricity, magnesium, and aluminium we can dispense altogether with the sun for indoor work, and by the use of vegetable extracts we can render the gelatine film more uniformly sensitive, and thus partially remove one of the greatest drawbacks to photography, viz., untruth of relative tone. Colour still eludes us, though we are continually hearing rumours from Paris and Berlin that we are on the eve of the discovery ; no doubt something has been done in this direction, and certain colours have been produced on silver and gelatine plates ; but it has been almost conclusively proved that these are only due to

the interference of light by means of thin plates. Then in the reproduction from the negative, science has lent invaluable aid, and has shown us how platinum, iron and carbon may produce most beautiful and permanent results, and how in numberless other ways the impressions from electrotype and other blocks may be made of artistic and commercial value.

Such are some of the aids that science has lent to photography, and in return photography has not been ungrateful ; as a patient recording servant, she stands by the side of her master, ever ready to secure and render visible his discoveries and observations, and to record them with unerring accuracy. But she has done more than this, and Sir W. Huggins, in his recent presidential address, at the last meeting of the British Association, speaking of the aid photography renders to the study of astronomy, said that the discovery of the gelatine plate had opened a pathway to the unknown. This is very wonderful, but it is the fact, that thousands

of stars, quite invisible to the human eye, assisted by the highest powers of the telescope, have been, and are being, delineated on the photographic plate.

Sir W. Huggins pays the following tribute to the assistance photography is rendering to the study of astronomy. The passage is worth remembering :—

“Without the assistance of photography, however greatly the resources of genius might overcome the optical and mechanical difficulties of constructing large telescopes, the astronomer would have to depend in the last resource upon his eye. Now we cannot by the force of continued looking bring into view an object too feebly luminous to be seen at the first and keenest moment of vision. But the feeblest light which falls upon the plate is not lost, but is taken in and stored up continuously. Each hour the plate gathers up 3,600 times the light-energy which it received during the first second. It is by this power of accumulation that the

photographic plate may be said to increase, almost without limit, though not in separating power, the optical means at the disposal of the astronomer for the discovery or the observation of faint objects. Two principal directions may be pointed out in which photography is of great service to the astronomer. It enables him within the comparatively short time of a single exposure to secure permanently with great exactness the relative positions of hundreds, or even of thousands, of stars, or the minute features of nebulae or other objects, or the phenomena of a passing eclipse ; a task which by means of the eye and hand could only be accomplished, if done at all, after a very great expenditure of time and labour. Photography puts it in the power of the astronomer to accomplish in the short span of his own life, and so enter into their fruition, great works which otherwise must have been passed on by him as a heritage of labour to succeeding generations. The second great service which photography renders is not

simply an aid to the powers the astronomer already possesses. On the contrary, the plate, by recording light-waves which are both too small and too large to excite vision in the eye, brings him into a new region of knowledge, such as the infra-red and the ultra-violet parts of the spectrum, which must have remained for ever unknown but for artificial help."

A gigantic photographic chart of the heavens is in course of construction by the leading astronomers of Europe, which will require 22,000 photographs to complete, representing some 600,000 stars, and will doubtless reveal further wonders. And what marvels photography has already disclosed! The great nebulæ have been resolved into numberless stars, the dark spaces in the Milky Way have been found to be strewn with countless stars, and their distances are being calculated by the determination of the Stellar Parallax. Besides this, most important discoveries, by means of the spectroscope applied to the heavenly bodies, have been recorded by

photography, and more of their composition has been learned.

The sun and his spots are daily recorded at Kew, Greenwich, and other observatories, when not obscured by clouds and during eclipses. Most important and valuable pictures of the Corona have been obtained ; though so difficult are these to secure, that during the last thirty years the Corona has only been under observation for about thirty minutes. New comets, stars, and nebulae are also continually being discovered by the aid of the camera.

Of the moon most splendid photographs have been taken recently by the Brothers Henri of Paris, which show an enormous amount of detail ; the craters, so-called seas, and mountain ranges can be studied with the greatest ease, and their heights accurately measured. Some of these most interesting photographs have been reproduced in the "Photography Annual" for 1891, as illustrations to a very able article on Astronomical Photography by Mr. Albert

Taylor, to which we are indebted for much valuable information. With these photographs in our hand it is extremely interesting to trace the mountain ranges, some of them extending to 450 miles in length, and running up to a height of 18,000 feet.

A further survey of the moon's surface is in progress, to be completed in sixty-eight quarter sheets, which will bring the moon comparatively close to us.

Much information has also been obtained from recent photographs of the planets: the ring of Saturn, the belts of Jupiter, the ice cap of Mars, and even the moon of Neptune, 30,000,000 miles away, have all been permanently delineated, with a beauty and accuracy never before obtained. Such are some of the services photography is rendering to astronomy.

Turning now to mundane affairs, we find photography as a registering instrument of the utmost value to the man of science. For the meteorologist she records the rise and fall of his

thermometers, barometers, and other measuring instruments ; the earthquake, the lightning flash, and all aspects of clouds, sunshine, and atmosphere are recorded by photography ; thus an invaluable history of the weather is being written.

Another most important branch of science is that of spectrum analysis, by which we are able to dissect Nature, and follow her up into her most secret lair. Here too photography stands by, with her note-book ever ready, to record the results disclosed ; whether it be the constitution of some distant star, or the sun's Corona, the atmosphere of our own and other planets, or of some salt of silver or iron close at hand, all is instantaneously and unerringly recorded for future use. Captain Abney and others have done most valuable work with the spectroscope, so that we "now know definitely the spectrum value of every ordinary salt of silver and iron," and "can trace subtle chemical actions to their source."

Thus to the chemist photography is a most useful ally.

If we turn to other branches of science we find the same thing. Photo-micrography has made rapid strides, special lenses have been designed by Zeiss and others suitable for the work. Most valuable photographic records are now kept of microscopic work, and the wonders of nature in the infinitely little, as well as the infinitely great, are preserved for reference and illustration of scientific works. By these means the bacteria, those marvellously minute parasites of which we hear so much and know so little, are being reproduced by English and German scientists; this will doubtless throw much light on the nature and origin of infectious and tubercular diseases. In connection with this work it would be unfair not to mention Mr. Andrew Pringle, who has made many discoveries in microscopic photography. By means of the lantern these slides can be and are largely used to illustrate scientific lectures.

The medical profession are also pressing photography into their service for registering

stages of mental and physical disease, surgical cases, and operations of all kinds ; at many of the hospitals photographic clubs have been started. All this must be of immense assistance to medical science. In future, doubtless, all scientific works will be exclusively illustrated by photography by means of zinc and other blocks.

To the geologist and geographer the value of photography is manifest. The British Association have appointed a committee "for the collection, preservation, and systematic registration of photographs of geological interest in the United Kingdom," and we believe much good work has been done. The School of Mines also invites contributions of geologic photographs.

The importance of this is clear when we remember how quickly the exposed surface of Nature changes ; records of quarries, railway cuttings, cliffs and sections, moraines, plains of marine denudation, faults, dykes, and raised beaches, fossils, etc., all are of the greatest value

to the geological student, and when securely printed by a permanent process will form a most valuable record on which future theories may be safely built.

In map making and surveying for military and other purposes, photography is of the greatest use, and an interesting paper on this subject will be found in the "Photographic Reporter" for 1891.

There are many other branches of scientific study and research to which photography contributes assistance ; for the botanist, mineralogist and student of Natural History she reproduces the curiosities of the vegetable, mineral and animal world. Again, by means of instantaneous photography the velocity of projectiles and the force of explosives have been calculated, the shape of falling drops of rain and other fluids has been delineated, and the speed of the electric spark ascertained.

The above remarks will give the reader an idea of the immense value of photography as a

recording instrument in scientific research, and of the intimate connection between it and the different branches of science.

Those who simply look upon photography as a toy with which to amuse their leisure hours, have little or no knowledge of its latent capabilities ; but the earnest worker in either artistic or scientific photography knows that, like every other study, it spreads wider and wider, and every step in advance opens up fresh wonders and a more extensive horizon.

CHAPTER XI.

THE STUDY OF NATURE.

"The harvest of a quiet eye."—WORDSWORTH.

THE pursuit of landscape photography, if it does nothing else for its votaries, at all events takes them out into the open air, and teaches them to see things which most probably they have never observed before. The very fact of looking about to see what will make a picture must teach us something of the beauty and mystery of Nature, must enlarge our horizon, and give us ideas of beautiful things that we did not before possess. Photography may or may not be an art process ; at all events, in the hands of its ablest workers the result produced is often a very good imitation of art, if it be not art itself. Besides, who can tell what further



A WILTSHIRE COTTAGE.

discoveries may not do for us? The earnest worker is always looking ahead, eager to apply any new process or invention, if only he may improve his work, and get a little nearer to his ideal.

The study of Nature is, however, endless, and this is one of its greatest charms. The pride of a true artist is that he is always a student, and every day Nature reveals to him fresh beauties ; and so it is with a photographer, if he will only work and think, and open his eyes to see the wonders that are around him.

See what an interest a camera will give to an otherwise objectless walk ; but even without a camera much may be learned if the photographer is, as he should be, ever on the watch to mark down good subjects, like a sportsman marks down a covey of partridges. And yet how difficult it very often is to find a subject a second time ; the light has changed, or the day has clouded over, and what we admired so much in the morning looks totally

different under an evening light. In fact, in making pictures the light is everything. See what expression a burst of sunshine will give to a distant view ! How in autumn, sometimes after a rainy day, a whole forest will seem to blaze out in purple and gold, and those who have seen the afterglow in Norway or Switzerland will not be likely to forget its unearthly beauty. Watch the sea on a stormy day, when the sun is partially behind clouds, with the rays thrown down on the waves, lighting them up with a sudden glory ; or note the beauty of quiet evenings, when earth and sky are sinking into repose, what breadth and harmony pervade the scene. All these things are simply due to the ever-changing atmospheric effects, and much as we may rail at our changeable weather and fickle climate, for artistic purposes it is far to be preferred to the perpetual glare of light and cloudless skies of the South, where day after day the landscape lies bare and brown under the same monotonous blaze of sunshine.

Even in England, after a week or two of such weather, how we welcome a grey day and a cloudy sky.

Besides the beauties of effect, the colours of Nature are brought out far better on a grey autumn day than under the sunny sky of mid-summer; then we can enjoy the subdued splendour of the tertiary colours, the russets and the olives and the citrons which delight the soul of the artist.

It has been well said, that the study of Nature without system is a pathless wilderness, and no doubt it greatly facilitates the study to pursue some well-ordered plan. An artist makes numerous studies of separate skies, trees, rocks, and seas, etc., and by this means acquires a stock of natural forms and effects, which are laid up, not only in his portfolio, but also in his mind, so that he can reproduce them when required. A photographer should do the same, and instead of devoting himself, as most do, to the taking of views—endless views—how

much more improving it would be to take Nature in detail, and acquire a series of negatives of skies, trees, and foregrounds ; by this means he would obtain a deeper insight into the beauties of Nature, which would have a most important effect on his finished work.

Of the magnificence of the sky much can be reproduced by the camera with proper exposure. First, there is the cloudless blue of a spring or summer day. Who has not felt what Wordsworth calls "the witchery of the soft blue sky"? Then there are the glorious white cumuli, which float through the azure like ships upon a summer sea ; "the chain of tall white mountains that girdled the horizon at noon yesterday," as Ruskin calls them ; and far above all, like denizens of another world, the higher cirri, most delicate and beautiful of clouds. Then how grand is the gathering of the storm, especially over a wild sea, or in the mountains, when

"From peak to peak the rattling crags among
Leaps the live thunder."

And after the storm has passed some of the most beautiful cloud effects may be secured as Nature once more sinks to repose.

Again, on a grey day the drifting clouds are very beautiful, seen over a wide plain, or just touching the tops of the mountains ; sometimes the clouds and the mountains appear inextricably mixed up, and splendid effects are produced by the rays of sunlight striking through some, and lighting up others. Some of Mr. Peter Graham's work has rendered these effects admirably. Of the splendours of sunset and sunrise language fails to give any adequate conception, though some of Mr. Ruskin's word pictures are full of light and colour.

The poets, too, have given us descriptions of almost every aspect of nature. Byron describes the sunset thus :—

“ Day dies like the dolphin, whom each pang endues
With a new colour as it gasps away,
The last still loveliest, till—'tis gone, and all is grey.”

And Keble :

“ Ever the softest, tenderest light
Sets round the autumnal sun.”

While of the morning Shakespeare says :

“ The morn, in russet mantle clad,
Walks o’er the dew of yon high Eastern hill.”

Milton speaks of

“ The opening eyelids of the morn.”

And again :

“ Now morn, her rosy steps in the Eastern clime
Advancing, sow’d the earth with Orient pearls.”

In truth the magnificence of the sky is indescribable ; but at least some of its beauty may be hinted at, and, as Constable well says, “ The landscape painter who does not make his sky a very material part of his composition neglects to avail himself of one of his greatest aids.”

Then there is the whole range of atmospheric effects—storm and sunshine, wind and mist, frost and snow ; all should be carefully studied, as they

are of inestimable value in producing pictures, whether by means of the camera or otherwise.

Passing from the sky and atmospheric effects to the study of mountains, the photographer will be met with the difficulty of representing the distant mountains in their proper scale, as ordinary lenses have a tendency to dwarf the distance ; this, however, may to some extent be overcome by the use of longer focus landscape lenses. There is, however, no doubt, as Mr. Hamerton has shown, that we all, in drawing, exaggerate greatly the height of the distant mountains, and in his life of Turner a very interesting chapter, with illustrations, is devoted to this subject.

The mountains, however, are so extremely beautiful that no efforts should be spared in endeavouring to reproduce them, and splendid photographs of the higher Alps and their snows and glaciers are not uncommon. At every season, and under all effects, a mountainous country is a delight to the artistic worker, and

fortunately we have in Wales, Cumberland, and Scotland some of the loveliest mountain scenery in the world. Besides the grandeur of form, the beauty of the colours of mountains is indescribable. The distant ranges pure faint blue and lavender, or lost in a golden haze, the nearer hills every shade of purple, grey, and green, ever changing as the sunlight and storm sweep over them, they are at once the delight and despair of the artist, who knows that after all he can only reproduce a faint reflection of either the mountain gloom or the mountain glory. In the fourth volume of Mr. Ruskin's "Modern Painters" will be found a most useful and comprehensive study of mountain form, which we commend to the reader's attention; and a very interesting article on Alpine Photography by Captain Abney will be found in the *Photographic News* of September 5th, 1890.

After the mountains, we come to the plains and here many people make a great mistake when they talk of an uninteresting flat country

There is nothing like a good flat country for picturesque effect. Look at Holland, with its dykes and mills and barges and wide horizons, what pictures they make ! Or our own Fen country, with its reedy pools and flocks of wild birds and grey skies.

No, the really difficult country to paint or photograph is the unmeaning up and down country, which is neither hilly nor flat, with trim hedgerows and pollard trees ; but even here many beautiful studies of cottages and little bits may be secured.

In a flat country the artist must make much of the sky and atmospheric effects ; and what charming pictures may be made out of a good sky and a wide common or moorland, with perhaps a solitary figure driving a flock of geese or cattle ! David Cox revelled in this class of scenery, and produced the most beautiful pictures out of the simplest materials—you can almost feel the wind blowing in some of them.

Then there is the world of the forest and

woodland, with their mystery and ever-changing beauty. What pictures the very words call up of the primeval forests of America or Germany, when "wild in woods the noble savage ran"; or of the tangled forests of the Tropics, so beautifully described by Kingsley in his West Indian book; or of the solemn pine woods of Norway and Switzerland, with their red columns, and the delicious odour of the fir; or, again, of our own oak woodlands. Beautiful they all are at every season, in the fresh green of early spring, or the luxuriant foliage of midsummer, or the splendour of decay, when "Autumn's fire burns slowly in the woods," or even in winter, when we walk beneath

" Bare ruined choirs,
Where late the sweet birds sang."

And if we study the trees in detail, there is an endless source of interest and beauty. How suggestive are the very names of the trees, and how each one suggests its own character and special landscape,—the solemn rugged oak, the graceful

birch, "the lady of the woods," the grey-trunked beech, the graceful ash, the luxuriant elm; the deep tones of the fir, the cypress, and the yew, and the lighter tones of the poplar, the willow, and the olive—what a world of study and interest there is here! And when we examine the forms of trees and vegetation closer, new beauties are revealed both of form and colour. How exquisite are the forms of the branches, from the stern grandeur of the pine to the graceful curves of the ash, the beech, and the willow! What marvels of colour are the trunks of old moss-grown beeches and yew trees; then the forms of the leaves, how graceful, varied, and delicate are these—how individual, and suited to their needs! Nor must we overlook the shrubs, such as the laurel and the myrtle, or the vine, and hundreds of others, which add such beauty and grace to the landscape. We must, however, not omit the beautiful flowers, both natural and cultivated, with which we are everywhere surrounded. Flowers are a special study for the artist and

photographer, and with the assistance of isochromatic plates beautiful pictures can be obtained ; but we have not space to enlarge on this delightful theme.

In truth, all vegetation, from the monarch of the forest to the green grass, that delicate carpet of peaceful spears, or the gold and silver lichen of the rock, is exquisitely lovely, inexhaustible in its beauty, and "a joy for ever" to all who love and reverence Nature.

Rocks and foregrounds may be reproduced by the camera very successfully, as all their markings and stratification can be shown. In the early days of landscape art a rock was a rock ; it was of no consequence what kind, whether granite or slate or sandstone, so that it formed a suitable dark mass in the foreground. And there is a story told of Gainsborough, that he used to stimulate his imagination when he wanted a rock by using a piece of coal as a model ; but nowadays artists must be something of geologists, and must, if they paint rocks, show clearly

their structure and formation. We believe that there is a large field for photography as an assistant to the geologist, especially for securing accurate transcripts of sections and other geological features which are liable to destruction, such as railway cuttings, quarries, and coast lines. But independently of this, rock studies are most useful and interesting, and will teach the worker how the landscape character of a country depends entirely on its geological formation. For instance, in granite districts we get more or less rounded forms ; while in the slaty and limestone countries the mountains are sharp and angular, as in Wales and Switzerland ; and it has been well pointed out by Mr. Ruskin that a stone, if you examine it carefully, is a mountain in miniature with its markings and fissures, with moss for forests, and grains of crystal for crags.

Lastly, there is the marvellous world of water, the source and origin of the beauty of the clouds and atmospheric effects, the modeller and creator of the earth, whose home is the everlasting sea.

Think for a moment how the animate life and beauty of the world depend on water, raised by the sun's heat from tropical seas, condensed by the colder air into clouds, which are wafted inland by the winds to discharge their moisture on the expectant land. That fleecy cloud just touching yonder distant mountain will pour its fertilising rain down its side in rushing streams, carrying not only fertility to the plains, but creating them by the *débris* they carry down, and far away in the distant sea "sowing the continents to be." Think how, in the form of snow and glaciers, it robes the mountains, and forms a veritable granary of waters for the use and benefit of man.

To the artist water is of inestimable service, as it brings another light into his picture ; even the muddy pools on the road reflect something of the beauty of the sky, and may be usefully pressed into his service. Streams and rivers are always beautiful, and compose well. The Thames from above Oxford to the Nore is a grand

panorama of pictorial effect, and will well repay artistic study. How lovely, too, are the streams and rivers in a mountainous country ! Rising far away from some mountain loch, or near some almost inaccessible peak, the crystal water oozes out of its mossy bed, and soon becomes a little rivulet, with its miniature falls, rippling on, now almost lost beneath some alder bushes, and now flashing into light again, making "sweet music with the enamelled stones."

Milton also speaks of

"The liquid lapse of murmuring streams."

In fact, streams and rivers have always been favourites with artists and poets; and, fortunately, in the United Kingdom we have no lack of such. Lakes have a special beauty of their own—Nature's mirrors, reflecting the glories of earth and sky ; whether surrounded by mountains, or reflecting the trees and vegetation on their banks, they are always lovely in their expression of calm

repose, and at times of stern grandeur, when swept by pitiless storms.

But what can we say of the sea, that emblem of eternity? Painters and poets have exhausted the resources of art and language in the endeavour to catch something of its magnificence. Ever changing, responsive to every atmospheric influence, lifelike in its restless motion, it is at once the glory and wonder of the world, "the best emblem of unwearied, unconquerable power." To paint it, Mr. Ruskin says, is "like trying to paint a soul." In fact, very few artists have successfully grappled with the difficulty. Even Turner, grand as some of his impressions of storms are, and who made it one of his special studies, has never given us the real drawing of near waves with the wash of their lace-like foam. The old masters shirked the difficulties altogether, and, with the exception of Claude, who reproduced one or two aspects of the sea admirably, not one of them seems to have had any idea of its subtle beauty; and of the modern

painters of sea, you may almost count the good ones on the fingers of one hand. Now the camera can and has produced magnificent sea studies, with every ripple mark and wreath of torn spray, and some of these have been most successfully enlarged.

There is no more fascinating branch of photography than studies of sea with a hand camera ; but you must not mind getting wet, and it is no easy thing to hold the camera steady in a gale of wind—but then it is that the finest effects are to be obtained. During the October gales on a rocky shore the sea is inconceivably grand, especially when the gale has continued for a few days ; then the air and the sea become mixed up together, and the waves and shore are one mass of yeasty foam, which hangs in wreaths from wave to wave. All this, combined with the roar of the wind and the thunder of the sea, forms one of the grandest manifestations of the powers of Nature,—one never to be forgotten.

But if grand in storm, how lovely is the sea at all times! On a calm evening how glorious is the light on the waters, that "golden pathway to the west," which seems to beckon us on to the regions of the infinite! Then there is the deep indigo-blue of mid-ocean, and the exquisite emerald and peacock-blue of the Mediterranean. Even in the south of England and the Channel Islands, on a fine day, the colour is indescribably lovely, shot with violet shadows of passing clouds across the pure emerald and sapphire. Then we see the "many-twinkling smile of ocean," or, as the lines of the Greek poet have been better translated, "the innumerable laughter of the waves." But, in truth, at all seasons and in all weathers, the sea is an inexhaustible source of wonder, ever changing, yet immutable.

"Time writes no wrinkle on thine azure brow :
Such as Creation's dawn beheld, thou rollest now."

There are many other phases of nature to which we have not alluded in this chapter, such

as the rainbow, fresh-fallen snow and hoar frost, the beauty of moonlight, and the splendour of the starlit sky, the exquisite colours of gems, shells and sea-weeds, the ever-changing interest of the seasons, each with its own charm—"the daughters of the year," who "dance into light and die into the shade."

But, in fact, the subject is endless, and we close this imperfect review of the world of natural scenery with a feeling of deep thankfulness for the wonders and beauties scattered so profusely around us, which are not only a never-failing source of exquisite pleasure in our hours of ease, but have power to lift us out of the troubles and sorrows of life's common day.

CHAPTER XII.

THE STUDY OF ART.

"Nature is the Art of God."

SIR T. BROWNE.

IF the study of Nature is wide and endless, that of Art is not less so. As Michael Angelo said, it spreads wider and wider, like the sea. It is, however, of great importance to a photographer to understand the elementary principles of art, and how to apply them as far as may be to his work ; and in the preceding chapters we have endeavoured to show how this may, to some extent, be done. In this chapter we propose to consider the subject of Art itself, and to suggest how it should be studied. It is a vast subject, and much has been written upon it ; but in the following remarks we shall endeavour to be as

brief and practical as possible, avoiding what may be called the metaphysics of art, which are as hazy and uncertain as metaphysics usually are.

Now, we think that the first thing to be done is to obtain a broad view of the subject. We should realise that there is a bond of union between all the arts ; and that painting, design, sculpture, architecture, etc., are all members of the same family, and, as Cicero says, have a certain common bond of union.

Then we should firmly grasp the idea that art is not the mere reproduction or imitation of Nature, but its idealisation ;* and that, as Mr. Moody has well said, " A perfect artist is a man who is in love with visible Nature, who studies and understands her aspects, assimilates them with his own nature, and reproduces them from his heart." For instance, the immortal works of Phidias were not mere portraits of the men and women of the time, but the idealised conceptions

* " La mission de l'art, n'est pas de copier la nature, mais de l'exprimer."—BALZAC.

of all that was noblest and most beautiful in a race remarkable for their personal grace and beauty. And it is the same with all great artists of all schools; whether they paint Madonnas or portraits, still life or landscape, the same principle runs throughout their work, its roots are based on stern reality and study of the facts of nature; but its perfect flower is the Ideal which has been defined as "the conception of a thing in its most perfect form." It will indeed be found universally true that all art not based on the close study of Nature is dead art, and expires of its own conventionalism: witness the art of Persia, India, and Egypt; while any art or school based on the study of Nature, though it may be in its childhood, and the "mere stammering of infants," yet has in it the principle of life, and will, in prosperous circumstances, become a goodly tree, bearing both blossoms and fruit.

The first thing, therefore, is the study of natural form; and here we would most seriously advise the student of art, if he has not

already done so, to learn to draw well in pen or pencil, even if he have not time to take up colour. A year or two spent under a good master, and in drawing from natural objects, will be of immense assistance, as it will discipline the mind and the hand, and disclose a thousand beauties of form and colour. It will, in fact, teach him to see. A good deal has been said about the different methods of art teaching, but there is no royal road to excellence in this, as in anything else. The great thing is to so learn the language of drawing as to be able to reproduce accurately, both in form and light and shade, any object before us; and any method which will enable us to do this is good. It is by no means easy to attain the command of pen or pencil so as to make it walk about and stop just like a well-trained horse, as Mr. Ruskin says; but perseverance will do much, and fairly accurate drawing may be as certainly acquired as the art of writing. Many good hints will be found in Mr. Ruskin's "Elements of Drawing," if

the student is fortunate enough to procure a copy of that somewhat rare work. The great thing is to seize the *vital* facts of Nature without depending on any particular "touch," and to remember that there is no general way of "doing" anything. This power of accurate drawing will not only teach us to see what we never saw before, but to love Nature, and to appreciate the works of the great masters of Art. It is true, drawing is only a language, and because we can draw fairly well, it by no means follows that we are or may become artists; that will depend upon whether we have anything original to say.

The study of works of Art of all kinds will next engage our attention. This is a lifelong business; but we think the best method of proceeding is to study the history of art in a somewhat chronological manner; and first we would strongly advise the careful study of the art of Greece in her statues and architecture. In the British Museum, at South Kensington,

and in the Schools of Art throughout the kingdom, will be found numerous examples of the remains of the art of Greece at its finest period.

Careful studies of some of these will be of the greatest value, and will store the mind with beautiful forms and graceful attitudes. Unfortunately, none of the Greek paintings have survived ; but from the repeated allusions to the works of Apelles, Zeuxis, Protagenes, and others in the classics, they must have been not less wonderful than their work in stone or marble. Passing from Greece to Rome, we shall not find much to detain us, as the Roman people were not artistic, and produced little original work in painting or sculpture, but were content to borrow their art, to a great extent, from Greece. When a great Roman made a collection it was to Greece or Sicily he turned ; and we repeatedly find Cicero writing to his friend Atticus, begging him to pick up for him at Athens some choice statue or work of art. After

the fall of Rome dark night seems to have fallen on the world of art—a night of nearly a thousand years' duration ; and the next period to which we must direct our attention is the period of the Renaissance in Italy, in the thirteenth, fourteenth, and fifteenth centuries. From that time to the present the chain of great painters has never been broken, and in the galleries of Europe we have magnificent examples left to us of their immortal works. Our own National Gallery is particularly rich in the works of most of the great masters ; in fact, no better school for their study exists, as the history of painting is more *fully* represented in Trafalgar Square than in any other gallery in Europe. Other galleries, such as those in Holland, Paris, Venice, Florence, Rome, Dresden, and Madrid, possess finer specimens of particular schools, but none of them possess such admirable examples of all schools. The only fault we have to find with our National Gallery is that it is growing too large ; it contains far too many inferior works of great painters

and of painters anything but great ; and it will become a serious question as to whether many of these should be allowed to remain in our National collection. For the purposes of education a few first-rate works of the greatest men of all schools are far preferable to the very miscellaneous collection we now possess. Mr. Cook has published an admirable handbook to the National Gallery (Macmillan), and Miss Kate Thompson's "Handbook to the Galleries of Europe" will also be of great use to the student.

The great schools of painting are : 1. The Italian ; 2. The Flemish and Dutch ; 3. The German ; 4. The Spanish ; 5. The French ; 6. The English. The following is a list of the chief masters of these schools ; there are of course many others, but a thorough study of the works of the painters comprised in this list will give the student a comprehensive and sound view of the art of painting.

I.

THE ITALIAN PAINTERS.

	BORN	DIED
Cimabue . . . (Tuscan School)	1240—	1302
Giotto . . . (" ")	1266—	1336
Orcagna . . . (" ")	1308—	1386
Fra Angelico . (" ")	1387—	1455
Masaccio	—	—
Fra Lippo Lippi (Tuscan School)	1412—	1458
Giovanni Bellini (Venetian ")	1428—	1516
Mantegna . . . (Padua ")	1431—	1506
Botticelli . . . (Tuscan ")	1447—	1510
Perugino . . . (Umbrian ")	1446—	1523
Francia . . . (Bologna ")	1450—	1517
Carpaccio . . . (Venetian ")	circa 1450—	1525
Leonardo da Vinci (Tuscan ")	1452—	1519
Michael Angelo (" ")	1475—	1564
Giorgione . . . (Venetian ")	1477—	1511
Titian (" ")	1477—	1576
Raphael . . . (Roman ")	1483—	1520
Correggio . . . (Parma ")	1494—	1534
Tintoretto . . . (Venetian ")	1518—	1594
Paolo Veronese (" ")	1528—	1588

[For further information about the Italian Painters see Vasari's *Lives*, 6 vols. (Bell), and Kugler's *Handbook* (Murray).]

II.

THE FLEMISH AND DUTCH PAINTERS.

	BORN	DIED
Jan Van Eyck (Flemish School) . . .	1390—	1440
Quintin Matsys („ „) . . .	1460—	1530
Memling . . („ „) . . .		—1495
Rubens . . („ „) . . .	1577—	1640
Hals . . („ „) . . .	1580—	1666
Vandyck . . („ „) . . .	1599—	1641
Cuyp . . (Dutch „ „) . . .	1620—	1691
Rembrandt . . („ „) . . .	1606—	1669
Paul Potter . . („ „) . . .	1625—	1654
Ruysdael . . („ „) . . .	1628—	1682
Teniers . . (Flemish „ „) . . .	1610—	1690
Jan Steen . . (Dutch „ „) . . .	1626—	1679

[See Wauter's *Flemish School of Painting*, and Havard, *Dutch School*.]

III.

THE GERMAN PAINTERS.

	BORN	DIED
Albert Dürer	1471—	1528
Holbein	1497—	

[See *Life of Albert Dürer*, by Scott, and of *Holbein*, by Woltman.]

IV.

THE SPANISH PAINTERS.

	BORN	DIED
Ribera (Spagnoletta School)	1588—	
Velasquez	1599—	1660
Murillo	1618—	1682

[See *Life of Murillo*, by Minor (Lowd), and of *Velasquez*, by Stowe (Lowd).]

V.

THE FRENCH PAINTERS.

	BORN	DIED
Nicolas Poussin	1594—	1665
Claude Lorraine	1600—	1682
Gaspar Poussin	1613—	1675
C. J. Vernet	1714—	1789

[See *The Spanish and French School*, by Smith (Lowd).]

VI.

THE ENGLISH PAINTERS.

	BORN	DIED
Hogarth	1697—	1764
Wilson	1713—	1782
Reynolds	1723—	1792
Gainsborough	1727—	1788
Turner	1775—	1851
Constable	1776—	1837
Wilkie	1785—	1841

[See also the works of Lawrence, J. Opie, J. Crome,

J. Ward, Stothard, Mulready, W. J. Muller, D. Cox, G. Morland, Romney, Blake, Nasmyth, F. Walker, Collins, Etty, Bonington, Eastlake, Leslie, Maclise, Danby, Linnell, Rossetti, Landseer. And for a history of the English School, Redgrave's *Century of English Painters*, and Chesneau's *English School of Painting*.]

In studying the works of all great painters the student will find much to admire and profit by, and also much to avoid. He will not fail to admire and appreciate the truthful and loving study of Nature as represented in most great works ; but, at the same time, he will not fail to observe how, in many cases, false conventionalities, such as brown trees and shadows, became stereotyped, and handed down by the false traditions of the schools ; but if the student is well grounded in the works of the old masters, he will be better able to appreciate the works of living painters—the difficulty is to discriminate amidst the enormous mass of work which the annual exhibitions afford. The last thirty years have no doubt produced some exceedingly fine painters, and we need only mention the group

of French painters—Corot, Millet, Rousseau, Diaz, Daubigny, and Ingres ; Israels and Troyon of the Dutch School, or Madrazzo and Fortuny among the Spanish ; Munkacsy, the Hungarian ; Costa, the Italian landscape painter ; or, in our own school, Millais, Leighton, Watts, Hook, Alma Tadema, Herkomer, and others, to prove that the art of painting is still flourishing.

The Art and Science Schools have no doubt done much to raise the artistic sense of the nation, especially in the art of design and decoration. Here great advance has taken place, as our modern houses and their furnishing prove. Much has been learnt from the art of China and Japan ; and Mr. Morris and Mr. W. Crane have lent great assistance to this branch of art.

All forms of book illustration have greatly improved, and much of this is due, as we have pointed out in a former chapter, to photography.

The wave of Pre-Raphaelitism which swept over us some forty years ago seems to have

spent its force ; but to this and to photography our modern school of painting is largely indebted, as greater accuracy is now required and attained in delineating Nature. As a reaction, we now hear of the Impressionist and Naturalistic Schools, some of whose votaries carry their worship to the point of absurdity, especially among the French. But, doubtless, their extravagances will not impede the advance of the main stream of Art, for there is no royal road to excellence in art except the close and reverent study of Nature.

This close study of Nature and her various appearances is well advocated by Mr. Francis Bate in his book on "The Naturalistic School of Painting," which, although it contains nothing very new, or that has not been thought and said before by most earnest workers, yet puts the case of Nature *versus* Conventionalism very strongly, and contains many interesting suggestions.

The chief points he insists upon are the

immense importance of "values," and the superiority of Nature's laws to conventional rules, the great importance of atmosphere and its effect upon relative tones, and the indissoluble union of light and colour. "Truth, absolute truth, to Nature," he says, "is the great rule for the painting of every picture." And again, "Our pictures should be accurate reflectors of the *appearance* of Nature; not copies of part of it, but reflections of the appearance of the whole of it."

All this is very true if not new, but it is rather late in the day for Mr. Bate and his followers to pose as the discoverers of a new style, or the only method of representing Nature, as if all *great* artists had not spent their lives in endeavouring to represent Nature as it appeared to them.

The study of Art, besides being a source of æsthetic pleasure and "a joy for ever," will teach its votaries many valuable lessons. It will teach us the deeper love of all that is

beautiful in Nature and in life, and will raise our souls by patience and humility to a higher atmosphere. It will also teach us the philosophy of life; it will show us that nothing is perfect in the art or life of man, and that the only perfect art is NATURE, which Sir Thomas Browne so finely described as *The Art of God*.

CHAPTER XIII.

PORTRAITS.

“The end of art is the interpretation of the soul of man.”

CHESNEAU.

MOST amateurs think it the easiest thing in the world to take a portrait, until sad experience and the execrations of their ill-used relatives convince them to the contrary.

In fact, there is no branch of art, photographic or otherwise, which requires more thought and knowledge of principles than that of portraiture ; it seems so easy, and is so difficult. Ask any good painter, and he will tell you that there is nothing more uncertain and exacting than the production of a satisfactory portrait. This arises from many causes : the subject may be a bad one, or the artist may not feel inspired by his work ; the

drawing and colouring may be correct, but if the soul, the expression, is missed, the result is failure. Even Sir Joshua Reynolds had many failures ; many of his portraits were never completed, and many were never taken away by the sitters, or paid for. Mr. Northcote, in his life of Reynolds, tells us that these unfinished and unclaimed portraits used to stand in rows, with their faces turned to the wall of Sir Joshua's studio. And this we fancy must be the experience of most artists who have a high ideal, and who cannot be satisfied unless they attain somewhat to it. A good portrait is an ideal work, as much as any other picture, and its beauty depends on something which can only be communicated by the *mind* of the painter to his work. It is a selection, as it were, of the best characteristics of the subject seen under the best aspect. Now, a photographic camera cannot select and combine, and it therefore gives us a plain, unvarnished representation, which is seldom satisfactory, and often vulgar.

And yet it need not always be so, as the beautiful heads taken by Mrs. Cameron abundantly prove. But in order to obtain artistic work the photographer must have the artistic spirit, and must have carefully studied and been imbued with the works of the great portrait painters. Although most photographic portraits, as we said above, are very ordinary things, yet for all that, being literal representations of our friends and of those who have left us, they are of inestimable value as history, if not as works of art. But much might be done and photographic portraiture raised to a higher level if the subject were properly studied, and the operators a little better equipped for the work.

The late Mr. Rejlander, who was an artist by profession, produced some very artistic portraits in photography ; the lighting and the attitudes were clever and original, but they were not appreciated by the general public, who were not educated enough to understand artistic work. We have no desire to bear hardly on

the professional photographer of the day ; he simply follows the demand. Ladies especially require to be made "beautiful for ever," and all wrinkles—those truthful historians of the past, the very life-lines of the face—must be painted out, and thus all character is obliterated. Like Queen Elizabeth, they must be painted without any shade on their faces ; Cromwell was wiser, for he insisted on all his wrinkles and warts being faithfully reproduced.

This, perhaps, was going to the opposite extreme, and while there must always be a certain amount of retouching, it should be strictly confined to removing freckles or flaws in the negative ; and this must be done with the greatest care, as every touch injures the likeness. The best education for a photographer is of course such as an artist undergoes, for without this it is impossible for the untrained eye to appreciate properly the subtle and delicate beauty of Nature, or the works of great painters.

The works of these great men must be also

continually studied, and we have in our National Gallery and in the National Portrait Gallery some splendid examples of the art of portrait painting. The works of Titian, Velasquez, Vandyck, Rembrandt, Holbein, Reynolds, and Gainsborough will well repay the most careful attention ; they are the greatest portrait painters of the world, though most artists have at times produced portraits. Unfortunately, in our National Gallery we have no portraits by Titian, and only one picture by Holbein ; but the others are fairly well represented. Sir Joshua Reynolds considered Titian as the first of portrait painters, and in one of his Academy Discourses he says, " His portraits alone, from the nobleness and simplicity of character, which he always gave them, will entitle him to the greatest respect, as he undoubtedly stands in the first rank in this branch of the art." The best works of Titian are to be found at Venice, and those of Velasquez at Madrid ; his works are remarkable for their force of



STUDY OF SEA AND SKY.

character, directness and strength of colour, and amongst the grandees of the Court of Spain he found splendid subjects for his pencil. It has been well said of the portraits of Velasquez, that there is an irresistible reality about them which makes them alive ; and his portraits of Philip IV. and Admiral Pareja in the National Gallery fully bear this out. Of this latter portrait it is related that the King mistook the picture for the Admiral himself, and rebuked him for being, as he thought, still in Madrid when he had been ordered away, so real and deceptive was the likeness. Vandyck also was a Court painter, and one of the most graceful ; he was the pupil of Rubens, and much of his best work is in this country. His portraits are full of grace and character, painted in the rich transparent manner of Rubens, yet with more subdued colours and in better taste. On his canvases the lords and ladies of the times seem to live again in all their stately splendour. Much may be learned from the careful study of his heads ; note

especially the celebrated "Gevartius" in the National Gallery, and the equestrian portrait of Charles I., which was one of the glories of the Blenheim Collection.

Of Rembrandt, the next great painter on our list, Mr. Ruskin says that his chief strength is in "rendering human character, not in chiaroscuro," which, he adds, is "always forced, generally false, and wholly vulgar." This, like many of Mr. Ruskin's dicta, is more forcible than true, for Rembrandt was equally a master in light and shade as in other matters. His "Portrait of a Jew Merchant," his own portrait, and that of "An Old Woman," and others in our National Gallery, show what a great artist he was, and are worthy of the student's closest attention.

Holbein was a painter of a different stamp. His portraits were distinguished for their stern realism, and his drawing and execution were as near perfection as possible ; his best works are in Paris, Berlin Basle, and Windsor. He was

introduced to Henry VIII. by Sir Thomas More, and painted many of the celebrities of the time, and a large number of his drawings of the persons belonging to the Court of Henry VIII. are still extant. See "The Two Ambassadors," National Gallery, No. 1314.

Of the portraits of Sir Joshua Reynolds and Gainsborough it is difficult not to be too enthusiastic. Reynolds, is, perhaps, a more masculine painter than Gainsborough, while the latter is especially distinguished for the grace and charm of his female portraits. And yet, when we think of some of Sir Joshua's ladies, and the natural and easy grace of his children, it is impossible to place him below his rival. In our National Gallery Sir Joshua is represented more fully than Gainsborough, and the portraits of "The Three Graces," Lord Heathfield, Admiral Keppel, Johnson, Boswell, and others, show him perhaps at his best. The portrait of Lord Heathfield is particularly fine: the attitude is grand; "the intrepid veteran, firmly grasping in his hand the

key of the fortress, stands like the rock of which he was the defender."

In Sir Joshua Reynolds' "Discourses," and in his life by Northcote, will be found many admirable hints about portrait painting. Northcote, who was his pupil, relates that Reynolds was ever striving to improve and to make each new picture an advance on the last. This is the true spirit for an artist to work in, and it should not be forgotten that much of the sad failure of Reynolds' colours arises from his continual and earnest endeavour to find out and rival the colouring of the old masters; it is a thousand pities that his experiments should, in many cases, have turned out such failures. Speaking of Sir Joshua's portraits, Mr. Ruskin says, "There was perhaps hardly ever born a man with a more intense and innate gift of insight into human nature than our own Sir Joshua Reynolds. Titian paints nobler pictures, and Vandyke had nobler subjects, but neither entered so subtly as Sir Joshua did into the minor

varieties of the human heart and temper." The works of Gainsborough, as a rule, are firmly painted and in good preservation. His two masterpieces are probably "The Blue Boy" and the portrait of The Honourable Mrs. Graham, now in the Edinburgh National Gallery; we think no finer portraits than these two were ever painted. See also his "Mrs. Siddons" and others in the National Gallery.

Besides the works of the artists mentioned above, there are in our National Gallery many splendid portraits, which the student should not miss; of these we may mention,—

"The Doge Loredano," by Bellini.

Three portraits by Van Eyck.

Two portraits by Frank Hals.

Several portraits by Moroni.

"The Chapeau de Paille," by Rubens.

"Pope Julius II.," by Raffael.

His own portrait by Andrea del Sarto, and others.

We have confined our remarks to the examples in our National Gallery, as they are easily accessible to all ; but there are scattered about the private galleries of England an immense number of fine portraits, such as we suppose can be seen in no other country. It will be observed from the study of the best portraits, that what the artists chiefly endeavoured to attain was the character of the person represented, and the expression ; and a photographer should do the same. Every head should be carefully studied, and no pains should be spared in trying different effects of light and background.

If only a head is attempted it should fill up the canvas like the heads on fine old coins, and not set in the middle of a great blank space. Beautiful portraits can be taken in an ordinary room by the window if the shaded side of the face is lighted up by means of a screen of paper or a clothes-horse ; as a rule, we think professional photographers have far too

much light on their subjects ; this gives them a flat, commonplace appearance.

Backgrounds should be as simple as possible ; an old panelled wall, or some of the artistic Japanese wall papers make very effective backgrounds. Above all avoid the miscellaneous Rococo furniture and sham scenes in which some professionals delight. A folding screen may be arranged so as to bring the darker part against the light side of the face, and the light side against the dark, but the contrast must be not too violent ; as a rule, the dark side of a head should melt into the background. All these combinations should be tried, and no pains spared to suit the background to the subject. The pose must be easy and natural ; sometimes an accidental attitude will give the artist just the effect he requires, and he must be ceaselessly on the watch to secure it when it comes. It is related of Sir Joshua Reynolds, that he often threw aside the portrait he was working on in order to secure some graceful and unconscious

attitude the model had assumed. After all, the expression is the most difficult thing to secure ; it is so evanescent and so variable, and depends on such minute differences of light and shade—a touch too much or too little will often spoil a fine portrait. Difficult as the taking of good portraits undoubtedly is, we think the careful intelligent study of the art will well repay any photographer who takes it up seriously and with the determination to succeed.

Besides having an artistic eye, the portrait photographer should be also somewhat of a physiognomist, and, as Mr. Leslie says, “he must be, what we all are in some degree, a judge of character by the signs exhibited in the face” ; and experience will teach us to look for the character in the expression rather than in the form of the features. This is why plain and even ugly people are often so charming ; they are redeemed by their expression, and it by no means follows that the most handsome people make the best portraits. A plain homely face,

with an intelligent or benevolent expression, is far more beautiful and lovable than that of a haughty beauty or a conceited Adonis.

Besides the features, the hands should be carefully studied, as a good hand is full of character, and should always be shown if possible. The hands of Titian, Rembrandt, and Holbein are easy and natural ; while those of Vandyck have an affected grace with their long fingers ; this degenerated into a confirmed mannerism.

Costume is always a difficulty ; but, ugly and stiff as much of modern dress is, it all, as Reynolds remarks, has light and shade, and with care and taste may greatly assist the production of artistic work. Much of the modern attire of ladies is no doubt very beautiful, but unfortunately they are so much the slaves of fashion and their milliners, that a lovely hat or style of dress never remains in long. The dress of men is much more difficult to manage, and a happy mean should be selected between the careless negligence affected by Lord Tennyson and the

stiff primness of our modern dandies. An old coat and a turn-down collar are more effective and picturesque than the most irreproachable "get up."

Mr. Leslie, writing of photography fifty years ago, says, "In its present state it confirms what has always been felt by the best artists and the best critics, that facsimile is not that species of resemblance to Nature, even in a portrait, that is most agreeable. For while the best calotypes remind us of mezzotint engravings from Velasquez, Rembrandt, or Reynolds, they are still inferior in general effect to such engravings, and they thus help to show that the ideal is equally a principle of portrait painting as of all other art; and that not only does this consist in the best view of the face, the best light and shadow, and the most characteristic attitude of the figure—for all these may be selected for a photographic picture—but that the ideal of a portrait, like the ideal of all art, depends on something which can only be communicated by the mind through the

hand and eye, and without any other mechanical intervention than that of the pencil."

All this is very true, and well worthy of our attention, for after all the camera is a "mechanical intervention," and its results, however fine they may be, can never compete with the best work produced by the mind and the hand of a competent painter.

Still, this need not discourage us, as the results obtained by what, for the want of a better term, may be called "Artistic Photography," are extremely interesting, and will teach us much of the beauty of Nature, and lead us to a sounder appreciation of the works of the great painters.

In conclusion, we will only add a word about printing, and would urgently advise photographers to avoid the highly glazed style so much in vogue; mat surface prints are far more artistic, and of all the numerous processes now used none can compete with the platinotype, as, in addition to the beautiful tones it affords, it has the supreme advantage of undoubted permanence.

CHAPTER XIV.

ATMOSPHERE.

“This most excellent canopy the air, look you, this brave o’erhanging firmament, this majestical roof, fretted with golden fire.”

SHAKESPEARE.

TO a landscape painter the effects of atmosphere are of the utmost importance, and yet how few pictures give any idea of the supreme beauty of atmospheric effect. Turner, great in this as in all else, carried his studies of effect to the very verge of Nature, and sometimes beyond it; yet how beautiful they are—alas! in most cases as evanescent as those of Nature herself; and we can well believe, from the wrecks that have survived of his oil pictures, that when first exhibited they must have been dazzling, and that no other pictures could live near them.

Fortunately, much of his work in water-colour is still perfect, and from this we can see what glorious visions of light and colour he possessed.

Constable also was a great painter of weather, and an untiring observer of all the phases of cloud and sunshine; his genius led him to prefer effects of storm and rain, with blue skies and white mountains of cloud piled up one on another; he was the master of what was called "great-coat weather." Among the French painters, Corot represented another aspect of Nature, and no one has produced the sentiment of haze and mist, the dreamy poetry of sunrise and sunset, with greater charm or truer feeling than he. The pictures of Cuyp, also, are mostly steeped in a dreamy afternoon sunshine. It will be seen from these instances that atmosphere is the very soul of landscape, and, as a rule, photographers totally ignore it; the craze for *sharpness all over* has blinded them to the subtle beauties with which the earth and sky are clothed as with a garment. In Mr. Bates's

interesting book, "The Naturalistic School of Painting," a story is related of a photographer who complained that he had one enemy to fight against that the painter was delivered from, viz., the atmosphere, which, as he said, blurred his picture, and "he was somewhat astonished to hear that the 'enemy' he was trying his best to overcome is sought after and cultivated by advanced painters for qualities necessary to the success of their pictures, and that the sharply-defined detail he so coveted is considered by them altogether subordinate in importance to the quality he was trying his best to eliminate."

Now we all know that the supreme beauty of Nature, to say nothing of her life, depends on the variations of the light and atmosphere which surround us, ever changing from hour to hour, mist and sunshine, rain, wind, and storm-clouds, producing for us picture after picture, and yet, as Mr. Ruskin says, most of it passes unregarded. But if we are to produce artistic pictures we must study these things con-

tinuously, and grudge no expenditure of time or plates in endeavouring to attain even a reflection of the glories of the earth and sky. And much of this beauty may be secured by photography, and though we cannot as yet reproduce the colours of the landscape, and suffer much from "obtrusive detail," yet by observation and arrangement much of this detail may be concealed by the judicious use of atmospheric effect.

A landscape which seems most ordinary under the full blaze of noon will probably become, on a misty day, or in the twilight, full of poetic mystery ; the ugly details will be hidden, and if we are fortunate in getting the correct exposure, we may secure a beautiful picture. And yet how few of us take out our cameras in the evening ! Again, in a mountainous country, how effective and beautiful are the fleecy clouds clinging to the distant peaks, and throwing soft shadows on the mountain side ; or, in a flat country, the cloud shadows sweeping over a vast

plain ! With our quick plates and shutters we ought to secure some of these things. Then there are the glories of sunrise and sunset, which can certainly be admirably suggested if not reproduced by the camera, by those who know how to handle it and who are alive to these supreme effects. Yet most books on photography tell us we must not point our lenses towards the sun. Why, that is the very thing we ought to do, for every artist knows that the most poetical aspects of Nature are those lying *under* the sun. Look at a mountain side lying in the full blaze of sunshine, how ordinary and prosy it looks ; but look at it under the sun, and it will assume an aspect totally different and suggestive of mystery and poetry ; or consider the sea under ordinary sunshine, and then look towards the sun along the golden pathway on the waters, and you will see one of the most beautiful and suggestive effects of Nature.

This may be secured with a moderately rapid

plate and shutter, especially if the sun is partially hidden by clouds and the lens shielded from the direct rays ; splendid studies of sea and sky may be obtained in this way with care and patience. A cloudy dappled sky is better than the full blaze of sunshine—in fact, a “southerly wind and a cloudy sky” are as welcome to a photographer as to a sportsman, and a day with a dry east wind is about the worst on which to take out the camera.

The above remarks will apply to the whole range of subjects, and we should note how Nature is always dominated by the state of the atmosphere, and, like ourselves, is “servile to all the skyey influences.” The study of these things will give an immense and additional interest to our art, if it be an art ; at all events, it will raise our work out of the region of the commonplace. We have all of us seen most beautiful clouds and atmospheric effects produced by the camera, and these, if not works of art as painters understand art, are yet infinitely

truer in effect than any hand work can ever be. It is a pity that this sort of work is so rare.

The great charm of quick exposures is that you secure the sky, and this gives an effect of atmosphere to which no time exposure can attain. Surely it is time that the day of blank skies was over, and no picture should be accepted at any exhibition without an appropriate sky. The photographer of the future will certainly smile at these white spaces which so often now do duty for the sky. In this changeable climate of ours, so beautiful for artistic effect, everybody is a born meteorologist and judge of the weather. We stand, as it were, on the edge, or at the meeting, of two worlds—the earth and the sky—and the study of both is equally important to the agriculturist, the man of science, and the artist ; in fact, the latter, who deals most with the appearance of things, is far more dependent on the world of air than on the world of earth for his inspiration.

And this world of air extends above us to

some one or two hundred miles. We are at the bottom of an atmospherical ocean, ever changing in its temperature, its moisture, and its appearance. It is at once the sustainer and beautifier of the earth, and all that is therein ; it is the laboratory of the clouds, the winds, and the waters, those sculptors and creators of the earth which while they nourish the earth with rain and mist, storm and sunshine for the service of man, at the same time adorn it with magnificence and beauty for his perpetual delight and instruction.

CHAPTER XV.

FIVE PHOTOGRAPHIC FACTORS.

WHEN the light is getting stronger, and our cameras are coming out again, perhaps the following remarks, especially relating to hand-camera work, may be useful, at all events to beginners. Most amateurs are, at first, hopelessly at sea on the subject of exposure and its modification by stops and shutters; and as correct exposure is nine-tenths of the battle, let us briefly consider the following five factors of correct exposure :—

(1) *The light*, varying from day to day and hour to hour.

(2) *The shutter*, ranging in speed from $\frac{1}{300}$ of a second to any length of time.

(3) *The diaphragm*, or stop, ranging usually

from $f/6$ to $f/44$ (the f representing the focal length of the lens divided by the width of the stop).

(4) *The lens*, of all sorts and kinds; their name is legion.

(5) *The sensitive plate*, usually of three rapidities—ordinary, rapid, and extra rapid.

Now it will be seen at once that here we may get endless combinations with these five varying factors, and the more advanced a photographer is the more easily he will be able to adjust these combinations, just as a good musician commands the whole range of his instrument, or the clever juggler keeps up a number of balls at once; but for ordinary work this is not necessary or advisable. Let us see, therefore, which of our five factors we can reduce from a varying to a constant quantity, and so reduce the number of combinations and render our exposures more certain.

To begin with *No. 4, the lens*. Let us select say a good doublet, or a single lens of about six-inch

focus, and stick to it for most hand work. The only advantage a doublet has over the single lens is that it will work at a larger aperture, but it is much dearer, and we think will not produce such brilliant or pleasing work as a good landscape lens. For architectural subjects, a doublet is best ; but if a properly stopped landscape lens is used, the distortion of buildings is scarcely perceptible.

No. 5, the plate. The ordinary or slow plates in a *good* light from May to September, especially by the sea, will be found all that we require ; in the yellow, smoky air of towns the rapid plates will be preferable.

No. 2, the shutter. This we can arrange at a fixed speed, say one-tenth of a second. This reduces three of our varying factors to fixed quantities, and leaves us free to concentrate our attention on *No. 1, the light*, and *No. 3, the diaphragm*.

The light we cannot alter, except by selecting our time of day ; but we can regulate the quantity

of it, if not the quality, which we mean to throw in our sensitive plate. We will therefore treat these two factors together, only premising that the hand-camera should be so constructed that the stops, revolving or otherwise, can easily be manipulated.

Numerous exposure tables have been published, but most of them are so elaborate as to puzzle the beginner, and the same remark applies to actinometers. The only thing we have to do is to confine our attention to the relation the size of the diaphragm bears to the condition of the light, and the only rule to remember is that "the stronger the light the smaller the stops." For instance, in sunlight from May to October, from 9 a.m. to 4 p.m., with stop $f/11$, we shall get a good picture of a well-lighted subject, using our shutter at its fixed rate of one-tenth of a second. Taking this as a starting point, we can vary our stops as required. For instance, if by or on the sea (same light), or if turned towards the sun, we must reduce our

stops, and use $f/16$ or $f/22$. After 4 p.m. the light will rapidly fall off, and we must use $f/8$ or $f/6$, and as the light declines we shall have to abandon the shutter, and extend the exposure to one or more seconds; but for this we must support the camera on a stand. On cloudy days (May to October) it is not always easy to work a hand-camera, but on some such days the light is very clear and actinic, and we have succeeded in getting good photographs with $f/11$ on ordinary plates, and with the shutter at one-tenth of a second. On these sort of days the doublet has the advantage over the single lens, as it can be worked out at $f/8$ or $f/6$. Some of the best work, however, may be done on cloudy days with $f/11$, and an exposure of one to two seconds.

On very dark days or under trees it is of no use to attempt shutter work, and we must have recourse to time exposures with $f/6$, 8, or 11, and full exposures, and for these no rule can be given.

In these remarks we assume, of course, that the lens is working at what is called "fixed focus." For $f/11$, our standard, everything will be in focus beyond about 22 feet, and many hand-cameras have arrangements for altering the focus according to the distance of the object.

In the winter months we must use the most rapid plates, and $f/6$ or $f/8$ on sunny days.

For all ordinary objects in motion, such as cattle, boats, waves, etc., one-tenth of a second is quite fast enough to set the shutter, but for near objects in rapid motion a much higher rate of speed will be required. It is a great mistake to use a more rapid shutter or plate than absolutely necessary.

If we are working chiefly with a view to the production of lantern slides and enlargements, as a rule snap shots are not available, as the detail is not sufficiently sharp; in this case we must rest our camera, and give time exposures with the smallest stops the light will permit us to employ; but many subjects, especially clouds

and waves, etc., can only be taken by using a shutter.

After all, experience is our only guide, and the memory should be assisted by notes of exposures and light.

Of all these five factors the light is the most important to consider, for the actinic power is altered hourly by the atmospheric conditions; mist and haze, east wind, clouds, and the altitude of the sun—all these things must be carefully noted, and our exposures regulated accordingly. For hand-camera work a good light is *absolutely* necessary; but given this factor, all the rest is easy. If the light is dull, and the subject dark and badly lighted, we must have recourse to time exposures; and for this purpose a stick tripod stand is most convenient, and a necessary part of the outfit of a hand-camera man.

Tables of exposure are, as we said above, only of very uncertain value; but for a *very* good light, such as we have here in Jersey from May to

October, we have found the following short table of use :—

MAY TO OCTOBER, 9 A.M. TO 4 P.M.—
ORDINARY PLATES, SHUTTER ONE-TENTH
OF A SECOND.

A $f/32$ best light, sky and clouds.

B $f/22$ „ „ sea and boats.

C $f/16$ „ „ open landscape.

D $f/11$ without sun, open landscape (morning).

E $f/8$ „ „ „ „ (afternoon):

F $f/6$ dull weather.

Under trees time exposures.

CHAPTER XVI.

ROUND ABOUT JERSEY WITH A CAMERA.

"Summer isles of Eden lying, in dark purple spheres of sea."

TENNYSON.

THERE are few more delightful places for a holiday than the Channel Islands, and to the man weary of town life nothing can be more charming and invigorating than the thorough change of scene, fresh air, sea breezes, blue seas, green lanes, and rocky bays, which these islands afford. The following remarks will, however, be confined to the island of Jersey, chiefly from a photographer's point of view, as inquiries are continually being made in the photographic papers as to its capabilities for a photographic tour:—

The island of Jersey, the largest of the group,

is one hundred and thirty-three miles from Southampton and ninety-three miles from Weymouth, and within fifteen miles of the coast of France, whose white sands may be distinctly seen in clear weather. The most convenient route for Londoners is *viâ* Waterloo and Southampton. The mail train leaves London every evening, except Sunday, at 9.45 p.m., and runs alongside the boat at Southampton.

The boats are new and very fast, leaving at 12 midnight, and timed to reach Guernsey about 6 a.m., and Jersey at 8 a.m. The fares are moderate: 1st class return, two months, £2 8s.; 2nd class, £1 13s. Travellers from the west of England will probably find the Weymouth route more convenient; the boats are equally fast and good, the fares are the same as the Southampton boats, but the sea passage is about two hours shorter. These boats leave Weymouth every morning, except Monday, at 2.30 a.m., and arrive about the same time as the South-Western boats. There is also a boat

several times a week from Plymouth direct. In the summer the sea passage is delightful ; but in the winter sometimes much delay is occasioned by fogs and gales ; though this will not matter to the photographer, as then he will, most probably, be comfortably at home preparing lanterns lides.

The approach to Jersey on a fine morning is very beautiful ; after leaving Guernsey, and rounding the Corbière lighthouse, the bay of St. Aubins lies before us on the left with villas and terraced gardens, and the town and harbour of St. Heliers will be quickly reached if the tide is favourable. At low tide the passengers are landed in open boats. This is a great inconvenience, especially to invalids.

The photographer must not expect very grand scenery in Jersey, as there are no mountains and no river or lake, but the valleys are very picturesque, and the rocky bays lovely. Beautiful subjects will also be found in the old lanes, but as a rule the trees are not very large, and in

many places have been ruthlessly cut down and topped by the farmers, who are entirely devoted to the cultivation of early potatoes. It is much to be regretted that many of the old orchards have thus been destroyed. The island consists nearly entirely of granite and porphyry, and in some places this is overlaid with a slaty schist.

At the west of the island there are large sandy dunes, which have swallowed up many acres of land, and may be still seen advancing in some parts of St. Ouen's Bay.

On the east at low tide will be seen great spaces of rocks and pools, whence *vraic*, or "the harvest of the sea," is largely gathered, and forms a most valuable manure.

Some admirable subjects may be obtained when this harvest is going on with rustic figures and carts. The main roads are good and well kept, and the photographic cyclist will find every accommodation in the way of repairs, etc., in St. Heliers should he unfortunately come to

grief. The climate of Jersey is, as a rule, very mild, especially in the winter ; snow seldom lies long, and hard frosts are comparatively rare. Last winter, however, was an exception, and the long-continued frost has killed all the outdoor geraniums and many other plants which usually flourish here all the year round ; the myrtles, lemon plants, and other shrubs have also suffered severely. In the spring the winds from the north and the east are cold, and last till May, but the summer and autumn are beautiful ; day after day of cloudless weather succeed each other, and it is seldom too hot, as the heat of the southern sun is tempered by the sea breezes. The actinic power of the sun is very great, much more so than in England, and the photographer will find that slow plates are sufficiently rapid, even for snap shots.

We will now suppose our visitor to have escaped the perils of the deep and the clutches of the boatmen and touts on the pier, and to have reached the town of St. Heliers in safety.



A JERSEY LANE.

Here he will find ample choice of hotels, for description of which we must refer him to his Black or Murray. Some of them are very well situated, but the Grand Hotel on the Parade, facing the sea, in point of situation certainly surpasses everything else in St. Heliers. Charges are moderate, and by arrangement visitors can be boarded at about 8s. a day. Seaside lodgings are not very plentiful in the season, but the charges are reasonable ; good seaside lodgings will be found at Havre des Pas, which is a very pleasant suburb. There are also quiet country hotels at Bouley Bay, Rozel, Pontac, and St. Aubins, which latter is a most picturesque village about five miles from St. Heliers. Here will be found good hotels and excellent lodgings ; there is no prettier place than St. Aubins for a quiet stay, and the Somerville Hotel will be found excellent in every respect. St. Heliers is a large town, containing some 30,000 inhabitants ; the streets are narrow, but the shops are good, and all the necessaries of life and a great deal more

can be obtained at moderate prices. The visitor should especially notice the harbour, where some good shipping subjects can be secured ; the old square, the memorable scene of Jersey's great battle in 1781, and the spot where " Pierson fell." There is a very fine public library, and the Royal Courts and new States room are worth inspecting. There are a few good street subjects in St. Heliers, but otherwise there is not much to detain the photographer. The parish church is not very interesting, though very old ; in fact, there is nothing in the way of architecture in the island, except the ruins of Mont Orgeuil Castle, of any importance.

A fine subject or two may be obtained of Elizabeth Castle, especially at low tide at sunset. This old castle has an interesting history. It was here that Charles II. found an asylum, and here Lord Clarendon wrote his history of the Rebellion. A very interesting account of Charles's stay here will be found in Dr. Hoskyns' valuable work, which is compiled from original sources.

The town of St. Heliers is clean and cheerful, having many good villas in its environs. The visitor will also find a public park, lawn-tennis ground, a theatre, and many other attractions. There are also several clubs, to which strangers properly introduced are readily admitted. There is a capital circulating library; the bathing is good, and there is no duty on tea or tobacco. What more can any one require? The photographer will say, "How about a dark-room?" Well, Mr. De Faye, photographic chemist, David's Place, can accommodate him in this respect for a small charge, and he also supplies plates of several makers, and other photographic requirements. Jersey also boasts an Amateur Photographic Society (at No. 21, Grove Place), which holds monthly meetings, and arranges excursions during the season. Visitors introduced by any member will be gladly welcomed by the society.

In the season numerous excursion cars run to all parts of the island; but the photographer

will, we think, rather avoid these if he wishes to do good work. There are two short railways—one to Gorey in the east, and the other to St Aubins and the Corbière in the west; trains run frequently.

The first excursion we propose to the visitor will be to Mont Orgeuil Castle, which is easily reached by the Eastern Railway in about half an hour. After leaving St. Heliers the line runs along the coast, and many pleasant glimpses of old orchards and pastoral scenery will be observed. After passing Grouville, where there is a large common devoted to golf and rifle shooting, the village of Gorey is soon reached. Gorey is an old-world place, and looks in a decaying condition, partly owing to the failure of the oyster beds, which some years ago were most prolific; and we have heard old inhabitants declare that the harbour in those days was crowded with boats, and that the fishery employed upwards of 2,000 persons. It is quiet enough now, but still the old castle rises proudly

over the town. It is a grand ruin, and has a most interesting story, full particulars of which will be found in Messrs. Latham and Ansted's volume.

The photographer will find many good subjects here. The best general views are from the end of the pier, and also from a sandy bay to the east of the castle. The old gateways and the courtyard are also well worth taking, and there are many good bits of old masonry. One or two days may be well spent here, and the visitor should by no means omit to ascend to the top of the tower, where a grand view is to be obtained of a large portion of the island and the white shores of France; on a clear day the Cathedral of Coutances may be distinctly seen. There is a pleasant walk or drive from Gorey round the coast to Rozel Harbour and Bouley Bay, and some good coast and rock subjects may be secured *en route*. Returning to St. Heliers from Bouley Bay, the pedestrian should avoid the high road and keep to the valley, down which runs a little

stream. This route passes through some lovely old lanes and by some pretty cottages. Another good day may be spent at Greve-de-Lecq on the north coast, and the most pleasant way is to drive or walk through St. Peter's Valley, past St. Mary's Church. If the pedestrian takes the Western Railway as far as Millbrook, he will find it a most delightful walk to Greve-de-Lecq. There are many other beautiful valleys, some of which have good mill subjects ; the only way is to explore on foot—the Val des Vaux, near St. Heliers, the Waterworks Valley, starting from Millbrook, and others, will afford good subjects. From Greve-de-Lecq the coast both ways may be explored, and fine rock subjects will be met with at Plemont ; in fact, the whole of the north coast is very rocky and grand. The visitor should take particular notice of the state of the tide, as in some places it rises thirty or forty feet, and many accidents have occurred to incautious travellers.

Another day may be spent at the Corbière

Rocks and Lighthouse. The railway runs first to St. Aubins, where some good street subjects may be secured. It then follows up a very picturesque valley to Don Bridge and the Corbiere.

This part of the island consists largely of blown sand, and the district known as the Quenvais is well worth exploring. If the train is left at Don Bridge, a charming walk to St. Ouen's Bay can be taken, leaving the rifle butts on the left. In many places the advance of the sand can be observed; the botanist will find many interesting plants in this district. In early summer in many places the ground is covered with the burnet rose, sea stock, sea holly, sea poppy, and other plants. St. Ouen's is a magnificent bay, facing the Atlantic, and all this part of the island is wild and suggestive of nature.

At the Corbière lighthouse there are some fine rock subjects; several of the views illustrating this volume were taken there. Returning from the Corbière, the visitor should not omit

Beau Port, where some grand rocky pinnacles are to be seen, in some places covered with ivy. A short walk from here will bring us to St. Brelade's Church, the oldest in the island. It is really a beautiful spot, and the church and churchyard are well kept. At St. Brelade's there is a good inn, where weary photographers will find accommodation. From here a short walk up a lovely valley brings us to Don Bridge, where the train will soon take us back to St. Heliers, or the road over the hill to St. Aubins can be taken if preferred.

There are many other interesting spots which the visitor should inspect, such as L'Etac at the extreme north-west, where there is a fine pinnacle of rock standing out from the cliff. The Creux de Vis and Bonne Nuit Bay on the north will also repay a visit, and good subjects are to be met with at most of these places.

Independently of photography, the intelligent visitor will find much to interest him in Jersey, whether he be a geologist, botanist, or collector

of sea-weeds and marine fauna. The old laws and customs of the island are of great interest to the student, and the politician can here see Home Rule in actual and successful operation. He will not, however, meet with poverty or noisy demonstrations, for the natives of Jersey are a hard-working, prosperous people; and though they dearly prize their own laws and institutions, are thoroughly loyal to the Crown, and the Queen is perhaps dearer to them as the Duchess of Normandy than as Queen of England.

At the time of the potato harvest, in May and June, large numbers of peasants come over from Normandy and Brittany, and some good figure subjects may be obtained; the blue dresses and white sleeves and caps of the women are exceedingly picturesque. Lastly, we must say a good word for the Jersey cows, which, though they are quiet and gentle creatures, are always tethered; they give the best of milk, and form very admirable adjuncts to the landscape.

The expense of a fortnight in Jersey, including

railway and steamboat fares, should not exceed £10, and with economy it may be done for somewhat less. There is a boat every day to Guernsey, and in the season excursions can easily be made to Sark and the adjacent islands.

